

The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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English Foundry Practice.

Several months ago we illustrated and described what is known as Stewart's rapid cupola, invented by Mr. Stewart, and manufactured by Messrs. Thwaites Bros., of the Vulcan Iron Works, Bradford, England. At that time the cupola was noticed in connection with a fixed receiver. The accompanying engravings, for which we are indebted to Messrs. Thwaites Bros., refer to a system of portable receivers, and convey a very good idea of the foundry arrangement adopted by them.

With regard to the cupola itself, it will be remembered that its salient feature is that it contains three zones of fusion surrounded by as many rows of tuyeres, termed respectively lower, middle and upper zones. In the top row each tuyere is provided with a shut-off valve. These valves have their plugs connected together by pitch chains, and are operated simultaneously by one handle. The rows of tuyeres are all inclosed in a circular belt, and opposite each tuyere is a cover provided with a colored mica disk. The cupola is arched over at the top, and has an opening fitted with a damper door for the escape of the gases. It stands upon a cast-iron plate on four short columns, as seen in Fig. 1 of the engravings. This figure shows the "Rapid" cupola applied to a foundry and driven by a Root's blower and direct-acting duplex engine. Two cupolas are shown, one being fitted with a fixed receiver and the other being worked with portable receivers, which are seen at various points in the foundry. These receivers are shown in side elevation, end view and longitudinal section respectively, at Figs. 2, 3 and 4 of the engravings. A narrow-gauge line of rails, 15 inches wide, is used for rapidly and conveniently conveying the molten metal from the cupola to any required mold by means of the portable receivers. Each receiver consists of a wrought-iron casing, fire-brick lined and mounted on an angle-iron frame supported and carried on flanged wheels of the same gauge as the portable rails laid round the foundry. To one axle of the carriage is fixed a worm-wheel, actuated by a worm and hand-wheel, to permit of the easy transit of the receiver by hand, and to prevent its movement while the metal is being discharged. The receiver is fitted with a spout for tapping, and with two plugged holes, one on each side of the arched cover, for charging and for the escape of gases. The advantage of these portable receivers is that any number of them can be used in running large castings without interfering with the ordinary work of the overhead traveling crane, and thus completing the usefulness of Mr. Stewart's system, which has been supplied by Messrs. Thwaites to several firms.

Artistic Glassmaking.

The artist who can furnish designs to the Pittsburgh manufacturers of table glass, says the Pittsburgh Times, and guarantee their "taking" qualities, could retire in a few years with an independent fortune, buy a mansion on Fifth avenue and spend the rest of his days in glorious ease. These gentry are perpetually on the lookout for something new. They are always experimenting, always throwing out a bait and eagerly waiting for the public to bite. When they walk down Fifth avenue on the way home from church, it is not the preacher's arguments against Ingersoll they are thinking about. They are keeping an eye on the windows of the jewelry and china houses to see if they cannot discover something in the way of a pitcher, a goblet, a decanter or a tray that it would be worth while to copy in glass. If their eye strikes the proper article, over comes an artist on the following day, down goes the design on paper, and a week later the mold-maker is laboriously chipping it out in a circular piece of chilled iron. If it is an ordinary set of from 25 to 30 pieces, the molds will cost about \$3,000, though if the set is complete it may cost as high as \$16,000, that amount having been paid by a South Side firm for 65 pieces. The goods are thrown upon the market. They may have a tremendous run and bring thousands of dollars of profit; they may fall flat and make the entire outlay a total loss. There is scarcely a firm in the city whose lumber room does not contain thousands of dollars in molds that never paid the cost of their making. As a general thing the manufacturers make their own designs.

Said a member of a leading firm recently: "One or two employ artists, but not one out of 50 is of any practical use. They make design after design that is of no use what-

ever. They do not understand our work at all. We have to do the best we can and take our chances."

"Aren't there foreign artists who can do the work?"

"No, the designs that they make do not suit our people. They design articles with reference to a particular class of people, and they have the whole world, you may say, in which to sell that class of goods. With us it is different. We must make our designs with reference to the needs of all classes of people. We must make something that everybody will buy. It wouldn't pay to get their designs for a high class of goods; the demand in this country isn't great enough for them. A single factory in Pittsburgh would make enough for the entire country."

"How long does a design usually last?"

"The life of an ordinary design in glass is about two years, but many of them do not last longer than six months. Some of the most expensive and elaborate are dropped the quickest, and often a little inexpensive thing turns out a regular mint. For instance, a South Side firm once took the

of alligator skin. Imitations of cut glass and craguelled ware, which have had a big run for the past two years, are still much called for, though some manufacturers predict that their day will soon be over. Plain ware engraved is in steady demand. Victor Hue, a French mold-maker at Beck's works, has recently obtained a patent for an imitation diamond ware that is smooth on both sides, and thus avoids the housewifely objection of gathering dirt. It will be put on the market by Duncan, and it remains to be seen how the public will take to it.

The British Tariff.

As a matter of present interest we reproduce the following article from the St. Louis Democrat, which they publish in reply to a correspondent's request for information as to whether England is "an example of absolute free trade."

This question is frequently raised, in Congress as well as out. The answer depends on the meaning attached to the words of the inquiry; and, in passing, it should be

beer range according to strength from \$2 to \$6 a barrel of 36 gallons; and on spirits from \$2.54 to \$2.60 per proof gallon. Other rates are \$4.12½ a gallon on perfumed spirits and cologne water, 75 cents a pound on chloroform, \$6 a gallon on collodion, \$6.25 a gallon on sulphuric ether, \$3 a gallon on varnish containing alcohol, \$4.25 an ounce on gold plate, 37½ cents an ounce on silver plate and 90 cents a dozen packs on playing cards, all these duties being counterbalanced by excise duties or stamps on corresponding British-made commodities.

Among the ordinary import duties are the following, comparisons being made with the rates in this country:

	Great Britain.	United States.
Cocoa, B.	40	Free.
Cocoa, husks and shells.	40	Free.
Cocoa, manufactured.	40	Free.
Coffee, raw, B.	3½	Free.
Coffee, roasted or ground.	40	Free.
Chicory, raw, B.	3½	Free.
Chicory, prepared.	40	Free.
Dried fruit, B.	15	1 to 20
Tea, B.	15	Free.

Our rates on wines range from 50 cents to

establishment in New York desired to enlarge its facilities, and a new building was necessary. In excavating the area under the pavement it chanced that the workmen came in contact with a pole that had been set up by a local telephone and telegraph company, and they proceeded to remove it, but the company obtained an injunction and stopped the work of excavation, coolly claiming that to remove the pole would be infringing upon vested rights of the concern. This refreshing assumption has been overthrown and the injunction dissolved after several weeks of delay.

Forts of Chilled Iron.

The important part which iron is destined to play in the construction of coast defenses is well described by an army officer in a recent interview. He remarked:

The matter of defense is no longer a question of possibility; it is a question of the pocketbook. By a sufficient expenditure of money a fort can be built that projectiles from the heaviest guns ever cast will have no effect upon. Chilled iron, wrought iron and steel are now regarded as the best materials for forts. Of these, chilled iron is probably the best. Austria, Germany and Belgium use chilled iron for coast defense. England uses wrought iron. A good fort is made by putting a plating of steel over wrought iron. Chilled iron has never been penetrated. If the shield or plate fired at is not thick enough it may be shattered, but never penetrated. Wrought iron may be penetrated, but if the shot does not go clear through it is just as good as before. When three or four shots have penetrated a plate of wrought iron its usefulness is gone, but it is considered to have performed all the service it was intended for and its money's worth has been got out of it. The days of earth works and masonry fortifications have gone by entirely. They are only of use in these days of heavy ordnance as a protection for gunners against small shot, bombs and flying pieces of exploded shells. Masonry can be knocked out of time by shots from heavy ordnance very readily, and, as to earthworks, the best constructed earthen defenses have been penetrated for a distance of 50 feet.

There is no limit to the thickness of iron forts except the length of the guns. Iron turrets are being introduced for forts and are exceedingly effective. In England and on the Continent there are a number of them. They revolve just as do the turrets of monitors and turret ships. All the principles of the iron revolving turret as now used were incorporated in the designs exhibited here by Trimby in 1845. I have seen the fortifications of all the European powers, and England beyond a doubt has the finest and most complete system of coast defenses in the world. As to the cost of iron forts, it costs about \$19,000 a gun for works composed partly of iron and partly of masonry. In such works an iron shield is used to protect the guns and the gunners. This iron shield is between piers of masonry. A good all-iron fort can be built for \$56,000 a gun. Turrets cost from \$200,000 to \$300,000 a gun. England has several excellent turret forts, notably the one on the end of Portland Pier. The approaches to Antwerp are defended by four large turrets. Germany has several on the coast. France has a line of turrets on her German frontier, and Austria has the harbor of Pola strongly defended by turrets. The most approved method of working the turrets now is by steam-hydraulic power. That is, steam is used to work the hydraulic engines which turn the turret. Against a chilled-iron fort or properly constructed turret the guns of Her Majesty's ship Inflexible might pound in vain.

Armor Plates to be Made in Italy.—A Rome letter to the Liverpool Post says that the Venetian Industrial Company, who have a large iron foundry at Terni, will shortly commence the manufacture of the armor plates for the Italian Navy, which have hitherto been supplied by English firms. It has not yet been decided what system shall be adopted, and nothing will probably be done until after the conclusion of experiments now being conducted at Spezia, with the view of testing the relative merits of plates made of pure hammered steel and of iron and steel combined. In future, also, preference will be given as far as possible to native industry in the manufacture of boilers and engines for Italian men-of-war, the Naval Department being much dissatisfied with the material lately supplied by English contractors.

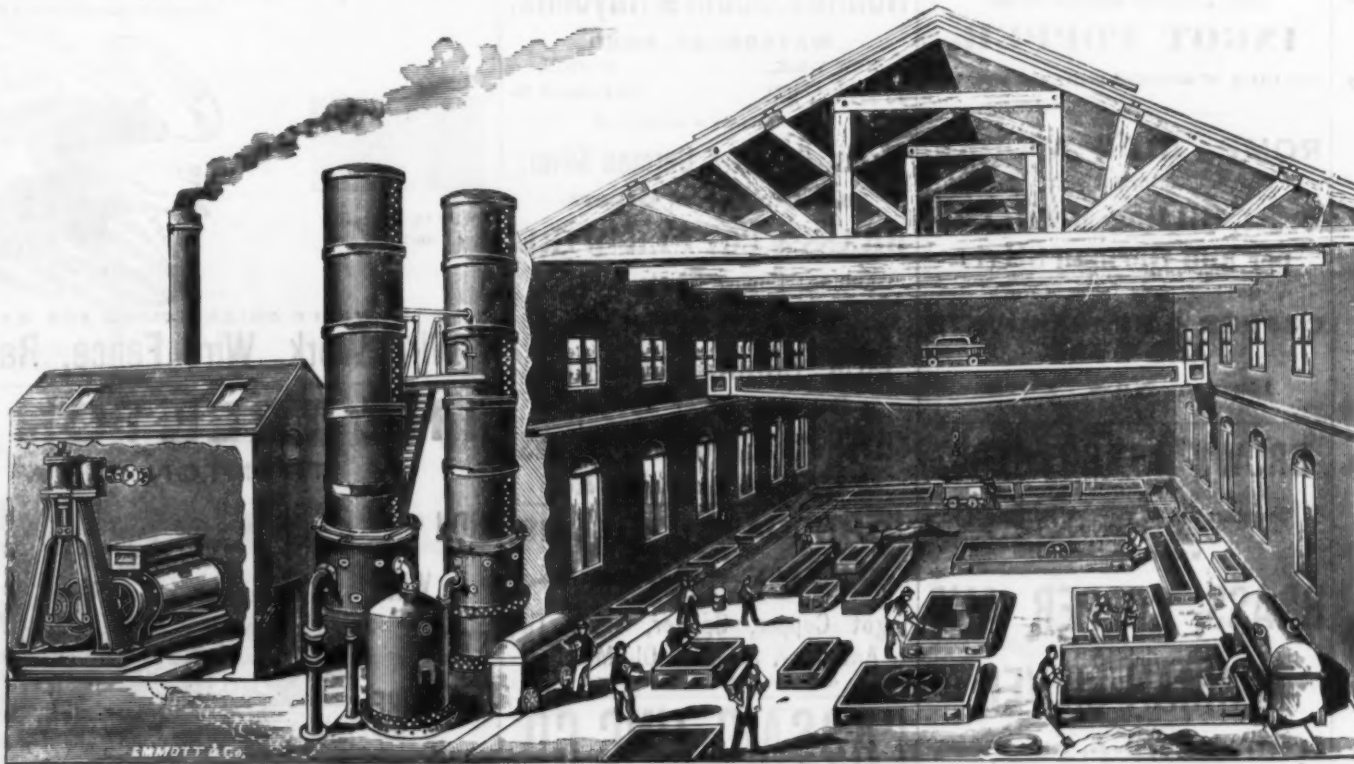


Fig. 1.—General View of Foundry Arrangement.

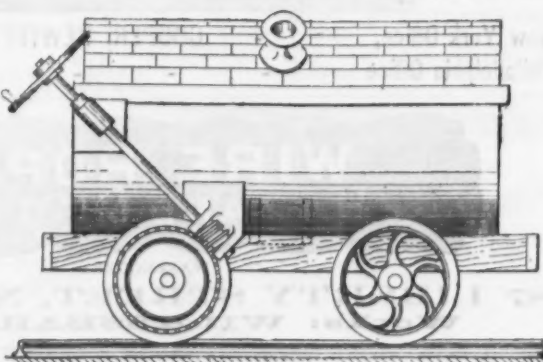


Fig. 2.—Elevation of Receiver.

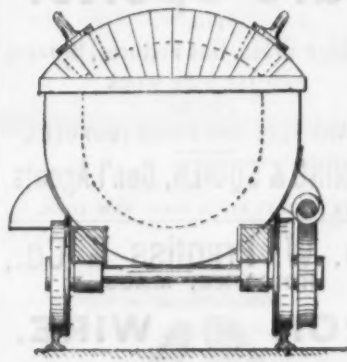


Fig. 3.—End View.

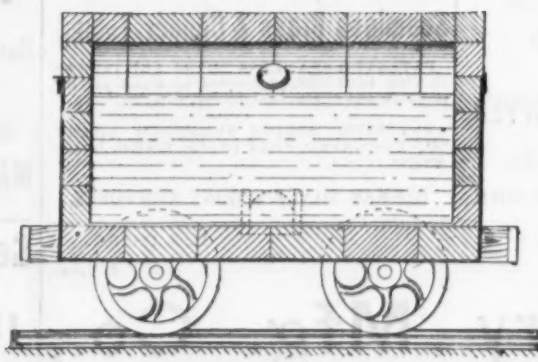


Fig. 4.—Longitudinal Section.

ENGLISH FOUNDRY PRACTICE.

design of a fish pickle dish in a china store. They changed it a little, patented it, and it had an enormous sale."

It is said that on an average the large tableware firms pay about \$10,000 a year for the item of molds and patterns. The material costs but little, the designing less, and almost the entire expense is in the labor. The work is done by about 200 mold-makers. Many of them are French and Germans, but the greater part are Americans who have been put through special training for their work. Good ordinary workmen make from \$18 to \$24 a week and the best receive about \$45. There are but two establishments in this part of the country employed exclusively in mold-making—both on the South Side. Most of the large glass firms have mold shops of their own, and do part or all of their own work. Adams & Co. and George Duncan & Sons, on the South Side, each employ about 18 mold-makers; Bryce Bros. and the O'Hara Glass Company, Limited, each employ about 15; King, Son & Co., Campbell, Jones & Co. and Ripley & Co. each about 12; Richards & Hartley about 10; Atterbury & Co. and Doyle & Co. about four each.

This year a number of novelties are being introduced. One of them is bronzed ware. The glass is given a coat of silver or gold on the under side, which is covered with a bronze. This is done in various colors and combinations, and is pretty. Another is the polka dot, and still another an imitation

said that a great deal of breath is wasted on both sides of the tariff issue, through lack of agreement among disputants upon the significance of the terms which they use. "Absolute free trade" is the phrase commonly employed to designate entire exemption from duties on imports. In this sense England does not enjoy absolute free trade, for numerous imports are taxed. "Free trade," again, is often held to be synonymous with "a tariff for revenue only." Attaching this meaning to the words, it is to be observed that with possibly three or four slight qualifications England is a free-trade country—a country, that is to say, in which duties are not laid to protect domestic industries.

The total number of articles and subdivisions of articles in the English tariff is about 50, as against 821 ratings in our own. The principal sources of customs revenue are tea, coffee, sugar, cocoa, wine, spirits, malt liquors and tobacco. But spirits, ale and beer, and some other articles on which import duties are laid, are also produced in England. If these were not subject to internal taxation, the duties on the imported merchandise would be at least incidentally protective. Accordingly, an excise tax is imposed on the domestic production to counteract the import duty, or the duty is laid to counteract the excise, whichever way one is pleased to look at it. The result, at all events, is to equalize the taxation. The duties on imported

\$2.25 per gallon. The English rates are 25 cents a gallon on wines containing less than 26° of proof spirits, 60 cents a gallon if containing 26° to 42° of spirits, and 6 cents additional per gallon for every degree of strength beyond the highest above specified. These rates, it will be observed, are imposed on commodities not produced in Great Britain.

It is evident, however, that there is a discrimination in favor of English manufacturers or preparers of cocoa, coffee and chicory, and this amounts to protection for them as against foreign houses in the same business. The same protection is extended to manufacturers of tobacco, for, while the duty on unmanufactured tobacco is either 84 or 92 cents a pound, the charge on manufactured chewing or smoking tobacco is \$1.04 to \$1.16, on snuff 98 cents to \$1.16, and on cigars \$1.32 a pound. To this very limited extent the British tariff is protective. It is possible, moreover, that these rates on manufactured cocoa, coffee, chicory and tobacco are at the "revenue point"—that is to say, that they are so pitched as to produce the maximum income for the Treasury. If this is the case, they do not violate the principle of a purely revenue tariff, though incidentally protective.

A peculiar conflict over the rights of property owners was recently adjudicated in one of the courts of this State. A manufacturing

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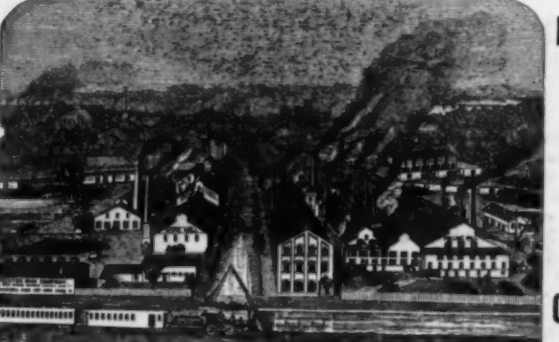
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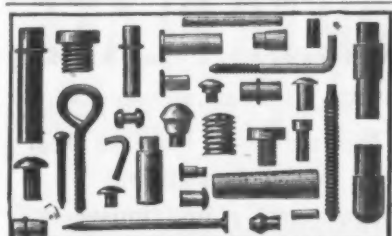
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" " "	79,210	110,890

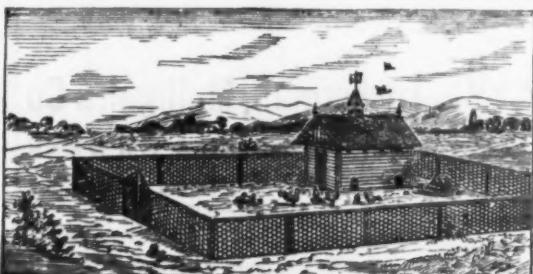
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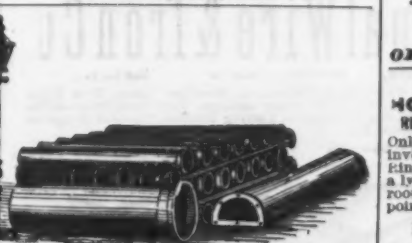
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Ores, Slags, Limestones, Coals, Clays, Fire Sands, &c. Agents for sampling ores in New York and
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The Seraing Steel Works.

The following description of the works and
mines of the Société Cockerill, Seraing, Bel-
gium, is from the report, recently completed,
of the Royal Commissioners on Technical
Education:

The commissioners visited the works of
the Société Cockerill, at Seraing, near Liège,
and were most courteously received and con-
ducted over the various departments by M.
Greiner, director of the steel department.
As is well known, the works were founded
by John Cockerill, a Lancashire man, in
1817. It is said that in the beginning of his
career, Cockerill—who, besides possessing
indomitable energy and perseverance, was a
thoroughly skilled workman—assisted by his
son, did all the forging, turning and fitting
of the little shop, the son often having to
turn by hand the lathe or drill at which the
father worked. At that time the population
of Seraing was under 2000; it is now 50-
000, including the adjacent villages. As
Cockerill prospered he purchased the old
palace of the Prince-Bishops of Liège, which
he transformed into a work-shop, eventually
roofing over one of the courtyards, which
now does duty as an erecting shop. The
offices for the clerks and draftsmen are situ-
ated in the original palace, the office of the
director forming a part of a large quad-
rangle, which is ornamented in the center by
an imposing fountain with four bronze
figures of brawny artisans. We were in-
formed that the works, including some of
the mines, now cover over 250 acres and
give employment to from 9000 to 10,000 men,
to whom £400,000 a year is paid in wages.
The company possess 280 stationary engines,
with motive power equal to 12,000 horses,
and they consume 1000 tons of coal and coke
per day. In addition to steel rails, which
they export to all parts of the world, boiler-
plates, and other kinds of steel and wrought
iron, they are able to produce each year 100
locomotives, 70 stationary and marine en-
gines, 10,000 tons of iron bridges, girders,
boilers, &c., and 14 iron ships, besides gen-
eral machinery, steel guns, hydraulic cranes
and many other kinds of ironwork. Except-
ing, perhaps, the foundry of Le Creusot, in
France, these works are unrivaled through-
out the world for the variety of their produc-
tions.

For the purpose of making our tour of the
works we were conducted to a handsome
tram-car drawn by a steam engine, which
started at the reception room of the offices.
We skirted the machine works, ascending
by an incline a huge mound of furnace
scoria. On approaching the top we alighted
at the collieries, about half a mile from the
offices. The coal shafts are about 7000 feet
deep, the cages being worked by powerful
and handsome engines, the whole enclosed
by buildings of a permanent and substantial
character. In these respects the pits' mouths
and banks presented a striking contrast to
those of England, where the gearing and
ropes in their passage from the engine to
the pit-head are usually in the open air. The
ventilation, as usual in Belgium, is by ex-
hausting fans; and we noted a large bar-
ometer in close proximity to the indicating-
clock, which latter shows the speed of the
ventilating engine. The barometer is con-
stantly under the eye of the engineer in
charge, and whenever it is depressed the
speed of the ventilating fan is immediately
increased, so that the increased development
of explosive gas, due to diminished atmos-
pheric pressure, may be as far as possible
balanced by increased ventilation. Gen-
erally these mines have been free from acci-
dents of a serious character, but two years
ago there was a terrible explosion, when 62
men were killed. The coal from one of the
shafts was landed and delivered to coke
ovens on the same level as the tops of the
blast furnaces adjoining, which they supply,
thus avoiding, as far as this portion of the
coke is concerned, any hand labor except for
moving the trucks on the level. The coke
ovens were of the Coppée pattern, producing
about 75 per cent. of coke from the coal.

The labor of dragging and pushing the
coal trucks along the viaduct from the top of
the shaft to the top of the furnace was per-
formed by women, who seemed robust and
healthy. We were informed that the Sera-
ing Company do not employ women under-
ground, and that the rough and exhausting
work in which we saw them engaged is vol-
untarily selected by them. To deprive them
from it would deprive many strong and able-
bodied women of a livelihood and tend to
raise the cost of production by limiting the
supply of laborers. In the Charleroi district
little girls go into the pits and take their
share of the rough work with the boys.
Many of them continue in employment at
collieries through life, but female labor is
becoming less and less common. Although
there is no law against the employment of
females underground, the public sentiment
of the country has risen against it in the
Liège basin. They are, however, commonly
employed on the banks, screening,
dressing, washing and moving the coal.

There is an evening school for miners con-
nected with the works, which is attended by
about 130 boys, all of whom, in addition to
elementary subjects, are taught the elemen-
tary principles of mining and the nature of
the gases which so constantly imperil the
lives of the pitmen. Three large firms have
started similar schools, and so convinced are
the rest of the colliery proprietors of their
importance that schools of the same char-
acter are being established in all the coal
districts.

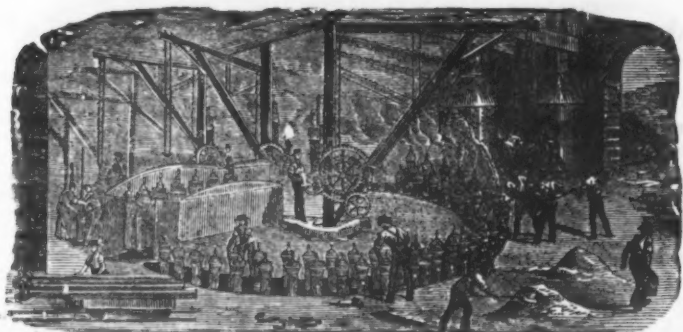
The wages of miners are paid by the ton,
and they earn on an average about 3/ per
day; banksmen earn about 2/6 per day;
women on the banks at tramwork, &c., earn
about 1/8 per day. The miners and the
men and women on the banks work in two
shifts of 8 hours a day each. Near the
mines are almshouses and an orphanage for
widows and children of miners who have
been killed or disabled at their work. The
institutions are maintained by the subscrip-
tions of the miners, and by large subsidies
from the company.

From the pit-head we were taken in the
steam tram-car up a further incline to the
summit of the huge mound of scoria, where
we found ourselves on a level with the tops of
a set of four new blast furnaces. The ore
which was being smelted is imported from
Bilbao, in Spain. The trucks from the rail-

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For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

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For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

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For Rollers, Fire-Boxes, Smoke-Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement, is unequalled for surface finish and exactness of gauge.

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MACHINERY STEEL.**FRANKFORD, PHILADELPHIA, PA."**

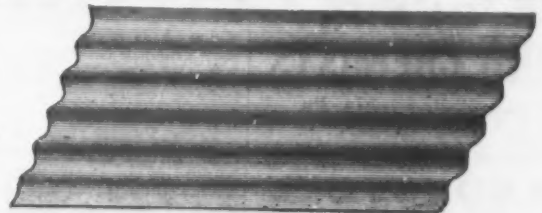
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FIG. 120.



FIG. 109.



FIG. 70.

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SEAMLESS DRAWN BRASS & COPPER TUBES,
CUT NAILS, HORSE NAILS, FORGINGS, &c.**NAHUM STETSON Jr.,** Agent, 73 Pearl Street, New York.

way, without being unloaded, are brought by locomotives to the top of the mound, where the contents are ready for being discharged with the greatest ease and economy of labor directly into the furnaces. We descended by an iron staircase to the foot of the latter, where some of the iron was being run into molds for pigs, and the remainder conveyed in a molten state to the Bessemer converters for steel-making. The spectroscopic is employed with great advantage in indicating the precise moment when the conversion is so far completed that the metal is ready for the addition of the spiegel, thus dispensing with the ordinary practice of arresting the blowing while "proofs" are being taken. All the work in this department was being carried on with precision and order, and the arrangements of the casting pits were very practical and complete. The men work in gangs, and are paid by weight, according to scale, each in accordance with the importance and difficulty of his work. Heaters earn about 5/6; rollers, 6/ per day; blowers and pourers of the metal average about 4/; the laborers who assist and remove the ingots are paid about 2/6 per day. The activity of the groups of men clustered at this point may be inferred from the fact that they make and pass forward to the next department upward of 350 tons of steel per day. The foundry is very large, well lighted and ventilated. A remarkable feature in the foundry was the excellence of the very large and complicated loam castings. In this department we were informed that the wages are from 4/6 to 5/ for the men, and from 9d. to 1/ per day for the boys.

The fitting and turning shop, and the engine-erecting shop, are of corresponding proportions to the other branches of the works. They are arranged with a view to economy and efficiency, and nothing seemed to be wanting in the way of tools and appliances for doing work on a large scale, and doing it well. Great cleanliness pervades the whole works. In the steel department alone they spend £120 a year on lessons. The mechanics, all of whom are paid by piece, earn as follows: Boiler-makers, about 3/3 per day; fitters, 2/9 to 3/; smiths, 2/3 to 3/6; laborers, 2/6.

The drawing office of an establishment turning out so much original, varied and complicated work is necessarily a department of importance. Upward of 100 draftsmen are employed, of whom the head is an Austrian, who received the theoretical training of an engineer in the Polytechnic School at Vienna. At least 25 of the draftsmen are Germans, Swiss and Austrians, who have gone through polytechnic or other technical schools. The rest are nearly all Belgians, some of whom have attended the University at Liège. One of the managers stated that when he was a boy the leading engineers in iron and machine works everywhere on the Continent were Englishmen. They were engaged at high salaries because of their practical knowledge of work and workshop requirements, and it had been a custom to select them from the works of rival English firms of eminence, so that they might learn the secrets of English skill and copy English methods. Since that time they have found that the English, though practical, are not scientific; they bring with them no advantages to compensate for the high salaries they require, and they are now seldom engaged. Although at one time several Englishmen held leading positions in these works, beginning with the founder, he was not aware that a single Englishman is at present employed in the entire works.

The company do not sell much of their produce in England, but elsewhere in all tenders for machinery, engines or raw iron and steel their chief competitor is England. In everything they make they take England as their guide and as their rival, and they are compelled to fix corresponding prices on all their products. They buy from England every tool that tends to cheapen production, and they watch the progress of English inventions and appliances as if England were situated across the river.

We were informed that, although all the departments of these vast works are connected with each other under one head, they are commercially distinct. The colliery manager sells his coal at the best price he can get for it. If the smelters and steam users of the establishment will not give as much for it as outsiders, he passes them over and sells to outsiders. In the same way, if these coal users can buy cheaper and better coal outside, they do so, and compel their coal manager to work "close to the nail." This method keeps all the departments up to the mark, and prevents them, in times of depression, from blaming each other for want of success. They all clearly understand, however, that the interests of the shareholders are best promoted by the harmonious working of all the departments, and this is secured by the supervision of the general director.

Boys are not admitted to the works under 14 years of age, and they are not bound for any period or for any definite employment or salary. There is no fixed age when a boy finishes his so-called apprenticeship and becomes a journeyman. When a boy comes to the works he is put to some simple occupation and paid by piece. The question of passing a boy forward is settled in accordance with the simple principles on which the works are conducted. They endeavor in everything to secure the best possible results by the most economical and efficient means. The dull boy is put to routine work and kept at it; the intelligent, quick boy is put to work that requires brain power and skill. In both cases their plan is mutually satisfactory.

Division of labor is universal. Many men learn to do one thing and no other. It would not be to their interest to take a boy or a man from a machine, or from some kind of work which he manages well, and put him to another kind of work which he would have to learn. Time and money would be lost during the process of learning, and neither master nor workman is prepared for the sacrifice. Almost universally a man prefers the work at which he can earn most money; call it a trade or only the tenth part of a trade, it is all the same to him, and any change of employment that would lower his wages would certainly cause him to com-

plain. Thus the apprenticeship system of former days no longer exists, and the division of labor, whatever may be its effect upon the general capacity of individual men, is pushed to quite as great an extreme here as in the large workshops in England.

On the question of the scientific and technical instruction of young men there were no two opinions among all those with whom we conversed. The managers of all the departments consider that, next to the best possible tools and appliances for their work, the most important factor is the technical knowledge of their men. In order to promote this knowledge they take great interest in the schools. Attendance at night schools is not compulsory, and they complained that many youths were apathetic and lacking in desire for improvement, but there was an undoubted superiority on the part of those who applied themselves to theoretical studies. When asked whether the naturally intelligent and studious youths would not surpass the dullards, even without attendance at night schools, the reply was that night schools were especially useful in developing and cultivating the natural faculties of the more intelligent young men. It was argued that dull apprentices were improved by education, but that intelligent apprentices were doubly improved by it, and that, therefore, looking at the question from the point of view of the employers, it was more important to educate the quick boys than the dull ones. We have already alluded to the school for miners, attended by 130 boys. There is also an industrial school, in which there are 100 students in the preparatory section and 270 in the industrial school proper. In addition to the technical and special schools, there are adult night schools connected with the works and the town of Seraing, which are attended by from 1800 to 2000 students, varying from boys to middle-aged men. Whatever disappointment there may be that the educational provision is not taken advantage of as it ought to be, these numbers indicate a considerable desire for instruction among the men, and reflect credit on the heads of the departments who encourage the young men under them to attend the night schools. M. Greiner strongly urges all young men in his department (steel) to attend such evening classes as are suited to their abilities and requirements. A monthly list of attendance is submitted to him, and in case of absence he demands to know the reason why. In instances of willful neglect of instruction and repeated absence without cause he has dismissed young men from his employment altogether. Happily, in requiring the attendance of apprentices, he has the co-operation of parents. The night schools are free. It was stated that in pushing education indiscriminately among young men there is a danger to be guarded against. Many who find that they know a little more than their companions become conceited and spoiled. They have an impression that because they know something of mathematics and algebra, and can draw a machine, they therefore ought to have their wages advanced, or be promoted to foremen. This feeling becomes less prevalent year by year, because the higher attainments among the young men are becoming more common. Time and experience correct the ambitious fancies of many of these young men, and the young fellows who get promotion, or take higher situations elsewhere, are those who excel in the class-rooms as well as in the workshop.

There are several societies established by the employers for the purpose of promoting good-fellowship and amusement. Among these are musical societies with brass bands, and orchestral bands of stringed and reed instruments. The workmen join in these entertainments. They have every winter weekly lectures in the largest room in the town, given by the heads of departments in the works, by scientific and literary men from the University of Liège, and by popular lecturers from different parts of Belgium. M. Greiner was advertised to give a lecture in the following week on the "Industrial Applications of Electricity," and he felt confident that he would have a large and appreciative audience, composed chiefly of workmen. Twenty-four lectures were to be given during the winter (1882-83). Musical and literary entertainments, analogous to the penny readings so popular in some parts of England at one time, have also been introduced. The music and readings are supplied by the workmen, and the meetings are often presided over by the departmental directors, or by leading residents unconnected with the works. There are also gymnastic clubs, and athletic competitions are periodically held.

There are no trades unions, and we did not hear of any organized methods for the settlement of disputes. Since 1838 there has been a sick club, to which all the workmen contribute. Until about 10 years ago the club was managed by the company in the interest of the men, but the system was abused, for workmen frequently claimed the benefits of the society on pretenses whose groundlessness could not always be disproved. A committee of workmen now manages the society, and investigates all applications for relief. Connected with the works are large and important co-operative stores, managed by the members of the society, in the same way as in England. Food, clothing, fuel and other necessities of life are sold at as near the cost price as possible, and the stores are largely patronized.

There was general unanimity among the gentlemen from whom we inquired as to the sobriety of the workmen. Not one of them had any serious fault to find with the men on the score of drunkenness; in fact, it is so rare as almost to be unknown as a cause of time being lost. When asked if many men absented themselves through drink, after a holiday, the manager of one of the largest departments answered by an emphatic "No." We were informed that many of the workmen reside 10 or 15 miles from the works, and come for the week, bringing their food with them. This consists of two large loaves, a piece of bacon, or sausages and eggs; they buy potatoes, onions, &c. They get lodgings for 2d. a night. This kind of life is quite common; small things satisfy these country people, and they save every possible farthing of their earnings.

Paris, 1878.

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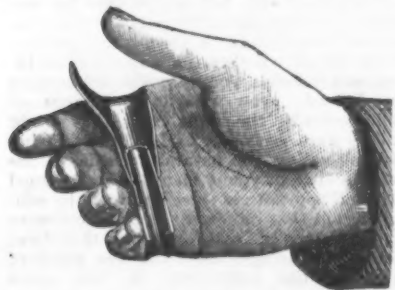
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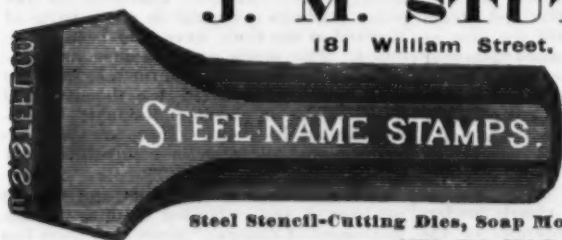
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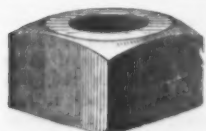
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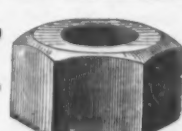
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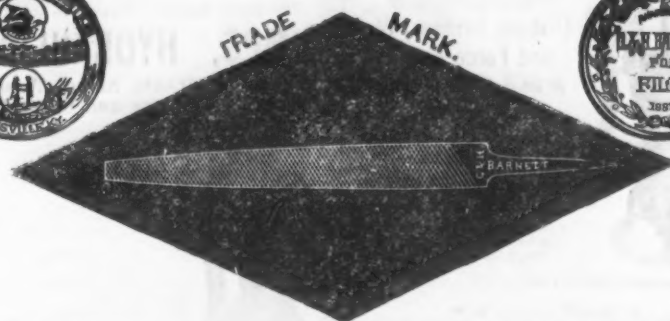
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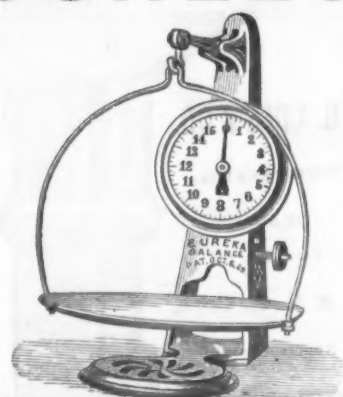
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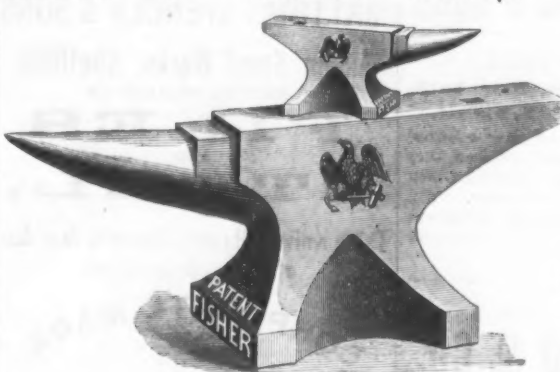
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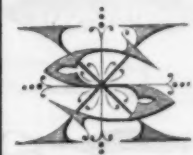
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SALE ON CREDIT—FINANCIAL CONDITION OF BUYER.

N sold goods to B, but before the sale was made by his traveling agent, L, the agent said to B: "It will be necessary to know how you stand." To which B replied: "I have \$3000 in business, merchandise and book accounts, and \$300 in cash." That he owed \$2100, B omitted to state. The order for the goods and the statement made were sent to the principal, and the credit asked for was given. The goods sent were seized by the sheriff, R, as the property of B. N brought replevin, claiming that by reason of the fraud of B in concealing his debt when asked his financial condition before credit was given to him, he took no title to the goods. The plaintiff recovered, and the sheriff carried the case—Newell vs. Randall—to the Supreme Court of Minnesota, where the judgment was affirmed. Judge Mitchell, in the opinion, said: "It is doubtless true that it is the general rule that a purchaser, when buying on credit, is not bound to disclose the facts of his financial condition. If he makes no actual misrepresentations, if he is not asked any questions, and does not give any untrue, evasive or partial answers, his mere silence as to his general bad pecuniary condition or his indebtedness will not constitute a fraudulent concealment. But this is not a case of mere passive non-disclosure. The object of the agent's inquiry, clearly, was to ascertain B's financial condition and ability to pay. The response was in reply thereto, and when B undertook to answer he was bound to tell the whole truth, and was not at liberty to give an evasive or misleading answer, which, although literally true, was partial, containing only half the truth and calculated to convey a false impression. The natural construction which would, under the circumstances, be put upon this statement is that B had \$3300 capital in his business."

PAYMENT—SUFFICIENT TENDER.

An action was brought to recover a debt, and the defense was made that the amount due had been tendered to the plaintiff, and the amount tendered was paid into court. On the trial it appeared that when the plaintiff saw the defendant on the street and demanded from him the debt due him the defendant said to him, "I have the amount owing to you (stating the sum) in my pocket-book, and I will pay it to you." The plaintiff replied that the sum mentioned was not more than a fifth of his demand, and that he would take no less. They separated at once. It also appeared that the full amount of the claim was seven times the sum tendered, and that the offer was an attempted compromise. In the trial court the judge found the amount tendered to be sufficient to pay all that was justly due, and gave the defendant costs. The case—Elderkin vs. Fellows—was carried to the Supreme Court of Missouri, when the judgment below was reversed. Judgeorton, in the opinion, said: "It is true that the defendant testified that he had kept, and, after suit brought, had deposited, the same money in court, but there is no evidence that the plaintiff was informed by the defendant or any other person of such deposit. So this pretended tender was a mere offer to pay a small sum to the plaintiff for his claim, and his refusal to take it. By all the authorities such an offer falls far short of a legal tender. The tender must be understood as a tender, and be absolute and unconditional. Any offer of a less sum than is claimed to be due cannot, under any circumstances, be treated as a tender, for such an offer is, necessarily, coupled with the demand that the whole claim shall be released."

CARRIER—FREIGHT—ROUNDOUT ROUTE—DEMURRAGE—CHARGE FOR UNLOADING.

B bought a quantity of coal, and the railroad company in transporting it had taken it wrongfully by a roundabout way, where it met with washouts, and charged freight for the full distance. B refused to pay the additional freight and the coal remained in the cars for a time equal to 85 days, for which time the company charged demurrage. They also charged full price for unloading the coal into their own bins. A judgment creditor of B's attached the coal in the company's hands, and they set up a lien for charges greater than the value of the coal, these charges being made up for the foregoing item of freight, additional freight, demurrage, and for unloading. The trial court gave the creditor judgment for the value of the coal less than the rate of freight for direct carriage, and the company took the case—Burlington and Milwaukee Railroad Company vs. Chicago Lumber Company—to the Supreme Court of Nebraska, where the judgment was affirmed. Judge Reese, in the opinion, said: "1. The company concede that the freight charges were more than the value of the coal, but seek to explain that fact by saying: 'The coal was wrongfully turned in transit from its proper course and went a roundabout way, meeting with several washouts, which caused the freight to be more than the coal.' We know of no rule of law which will permit a carrier to 'wrongfully' send freight by a 'roundabout' way, instead of over its direct lines, and so increase the cost of transportation. While this course might be instrumental in increasing the revenues of the carrier, it would be very injurious to the commerce of the country, which requires not only cheap, but direct and rapid, transportation. 2. It is not claimed that the charge for demurrage is made by virtue of any contract with B, and there is no statutory authority for it. We are unable to see any ground in law for such a charge. It has been decided in Illinois that demurrage cannot be demanded by railroads. When it exists at all in carriers it is only for sea-going vessels and is confined to maritime law. 3. The charge for unloading the coal into the company's bin cannot be allowed. They have

unjustly converted this coal to their own use, and surely they cannot make a charge for labor in making this conversion. The coal should not have been removed from the cars under the untenable claim for freight."

Co-operation in England.

It will probably surprise most people, says the New York Tribune, to be told that in England co-operation has made such headway as to induce a cautious journal like the Spectator to predict "that long before the century is out the whole of our working class will be in association, and will have the staple trades of the country in their hands or under their control." Yet the statistics of the movements seem to show that such a prediction is not idle exaggeration. At present there are over 1200 societies of working-folks, numbering 600,000 members. Almost all of them are heads of families, and they therefore represent 2,500,000 people, or one-twelfth of the whole population of the Kingdom. These societies possess a capital of \$45,000,000, and make a net profit \$10,000,000 yearly. Besides this they have a Wholesale Society, now in its 20th year, which, on a capital of \$200,000, does a business of upward of \$15,000,000, with a net profit of \$160,000. This concern has branches and depots in Scotland, Ireland, this city, France and Denmark, and owns three large steamers which play between England and the Continent on the company's business. And the constitution of this already great union pledges it the "promotion of the practice of truthfulness, justice and economy in production and exchange: (1) By the abolition of all false dealing, either direct or indirect; (2) by conciliating the conflicting interests of the capitalist, the worker and the purchaser, through an equitable division among them of the fund commonly known as profits; (3) by preventing the waste of labor now caused by unregulated competition." No society is admitted to the union unless it agrees to accept these principles as its guiding rules of business.

There is thus established a system which promises in good time to solve the most difficult economic problems of the age, and to find a common standing ground for capital and labor. And the absolute quietness and business earnestness with which co-operation in England is conducted augurs well for the results. There is no question of demagogism, no mountebank pretenses, no political hypocrisies to confuse and entangle the movement. It goes forward upon its simple merits, and it is successful because it contains the best elements of success. Why co-operation has failed to take root in the United States is one of the questions which provoked much speculation, but for which no satisfactory explanation has thus far been given. Perhaps the time is not ripe for it yet, but its results in England are so unquestionably beneficial that the movement seems certain to spread eventually, and to be taken up by labor wherever it is free to follow its own devices and to work out its own salvation.

A Frightful Mine Catastrophe.—On the 20th inst. the Buckridge anthracite coal slope, sunk in 1874 by May, Audenried & Co., of Shamokin, Pa., and now owned by the Philadelphia and Reading Coal and Iron Company, was found to be on fire. The slope is 1500 feet deep and the fire originated in the fan-house at a depth of 1200 feet. The flames ascended rapidly and soon issued from the mouth of the slope. As the timbers supporting the roof of the mine were consumed heavy falls of coal occurred and the roar of the fire was heard quite a distance. On the same day the Coal and Iron Company took possession of the Greenback colliery, located near by, and a hole was started from that colliery into the workings of Buckridge, a distance of 36 feet, so that a running creek could be turned into the mines through this hole. The damage to Buckridge slope will be very heavy. Seven hundred men and boys are thrown out of employment. On the 21st, while a number of men were engaged in boring the hole above referred to, the gas suddenly poured in from the burning mine, and, before they could escape, six men and one boy fell victims to the deadly fumes.

Marvelous Engineering.—The London Inner Circle Railroad is a marvelous feat of engineering skill, says the Philadelphia Press. Its runs throughout its entire distance under the busiest center of the largest city in the world, and the operations attending the excavation and construction have proceeded without serious injury to or interruption of business or traffic. Quickdams have had to be passed through, beds of old rivers spanned, lofty warehouses and massive buildings secured while their foundations have been undermined, and an intricate network of gas and water pipes sustained until supports had been applied to them from below. Added to this the six main sewers had several times to be reconstructed. Day and night the work has been carried on for 18 months, and now the engineers are able to announce that their tunnel is complete. The laying of the rails and the building of the stations are the only portions of the immense work that remain to be done, and in a very short time trains will be passing over the whole of this wonderful subterranean road.

The Japanese Government is about to make an important step in improving trade with the western world. The announcement is made that, in consideration of an immediate modification of the treaty negotiated with England in 1858, touching the separate jurisdiction of the five treaty ports, Japan is prepared to throw open the entire country and to remove all restrictions upon foreign residence, travel and trade. We are not informed as yet what these required modifications are; but that the Government of that country, under any circumstances, should thus offer free communication to all the rest of the world must be accepted as another long stride forward in the path of civilization and progress. Japan just now takes from us little besides petroleum, but, with the whole country thrown open to commerce, there can be no question that our trade could be greatly enlarged.

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NOW, This is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,

FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and

SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESSES—
E. M. REED,
(Attorney for Defendant.)

G. A. ROBINSON.

L.S.

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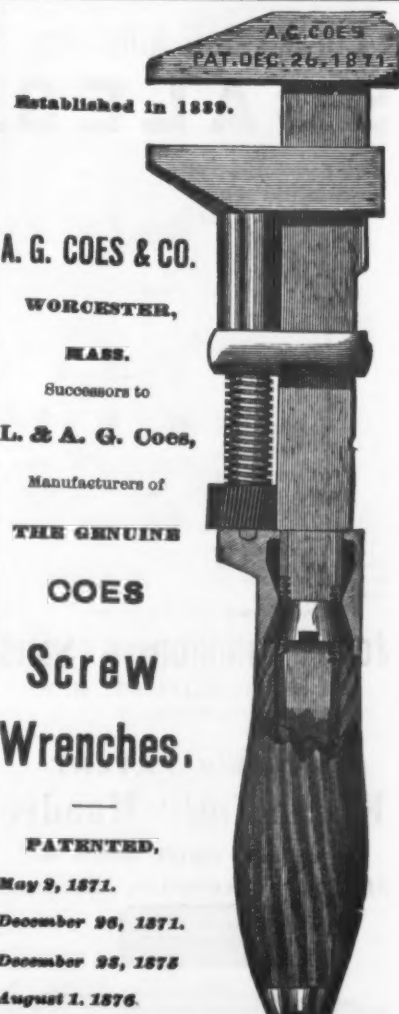
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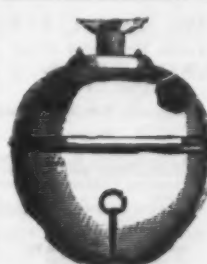
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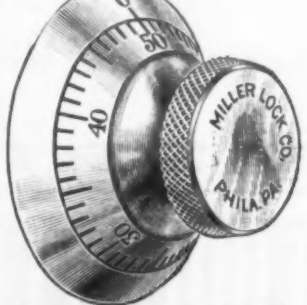
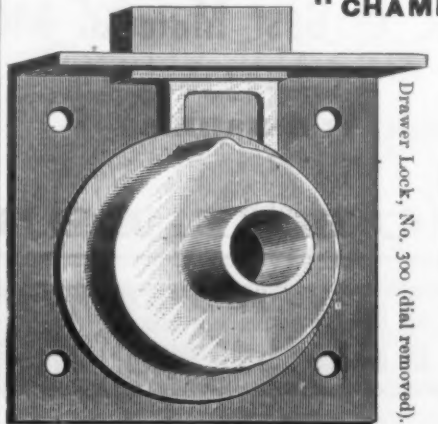
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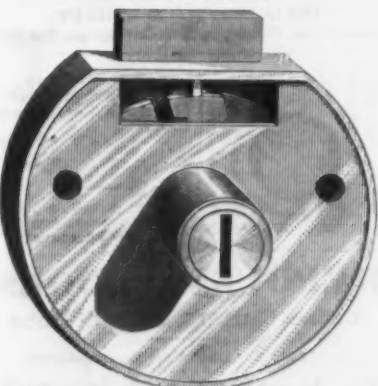
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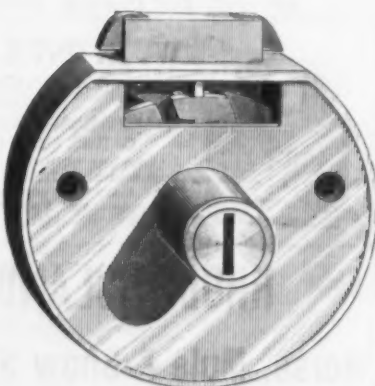
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The Supremacy of Natural Gas Disputed.

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The application of the gas for domestic use in heating dwellings and furnishing fire for cooking has been made in some instances, but it has not yet become general. It makes a very nice even fire in grates or stoves, does away with the necessity of carrying coal, is free from dust and ashes, and when universally used will relieve Pittsburgh of the smoke which has made it unpleasantly famous. But two supereminent objections to its use in dwellings have not yet been overcome. The first is that competition has not yet brought its price to domestic consumers below 50 cents per 1000 feet, and at that price it is much more costly than coal. The next is that the volatile and penetrating nature of the gas renders it somewhat hazardous to introduce it into private residences. At the pressure with which it is forced through the main pipes to the mills it will leak through the joints and valves, and even escape through the pores of ordinary cast-iron pipes and wrought-iron casing. Being odorless, its presence in a cellar or closed room could not be detected, and if generally introduced into private residences with out precautions leakages might occur which would result in disastrous explosions, as has occurred in two instances, fortunately without loss of life. To guard against this it is proposed to pass the gas over some substance which would impregnate it with a smell, so that a leakage could be observed, as in the case of coal gas. An invention has also been patented to convey the gas to the mills at high pressure through a main pipe, which will be surrounded by another pipe. The latter will form the receptacle for the leakage of the high-pressure main and will be a low-pressure main for the supply of residences. A pressure of 5 1/2 inches (water pressure) is stated by experts to be the highest that can be used with safety in the mains intended to supply gas for domestic consumption. When these precautions are adopted, and burners, ranges and grates are adapted to the use of the gas, a reduction of the price to 10 or 15 cents per 1000 will naturally make a decided saving, and will permanently abolish the ashes, soot and smoke now produced in immense volume by the bituminous coal of Western Pennsylvania. Attempts have also been made in the direction of using the natural gas for lighting purposes, but in its natural state it has little more than half the illuminating power of coal gas, and experiments to charge it with hydrocarbons for increasing its illuminating value have so far yielded no satisfactory results.

Railway Construction in India.

The report of the English Select Committee on Indian Railways, which has just been issued, is likely to have an important bearing upon the development of wheat production in India. The committee state that they have devoted their attention mainly to the alleged necessity for more rapid extension of railway communication in India, and the means by which this object may be best accomplished. In the first instance they refer to the chief recommendations of the committee which in 1878 and 1879 inquired into the expediency of constructing public works for the prevention of famine and the development of the resources of the country. That committee advised that the outlay should be limited to £2,500,000 per annum, and their recommendation has been acted upon, the Government of India having since annually applied about £1,800,000 to railways and £700,000 to irrigation. The policy has been to leave to private enterprise those lines which are commercially most attractive, and to construct, either directly by the State or through the agency of companies (under a guarantee), such lines as have been regarded as indispensable for protection against famine or for other urgent purposes, though not promising to be remunerative for the time being. As to future operations, a plan has been drawn up by the Government of India showing what railways they think should sooner or later be made. These are divided into two schedules, A and B. Schedule B contains 34 lines, with a total length of 3432 1/2 miles, of which the estimated cost is £24,288,000, and, as these are expected to be remunerative, they are left to private enterprise, without any Government aid beyond a free grant of the land required for them. Schedule A contains 30 projects, many of which are in progress, but 3896 miles remain to be made at a cost of £28,262,450, which it is proposed to spend within about six years. Part of the necessary funds to the amount of £200,000 per annum the Government of India proposes to take out of the famine grant, but the select committee condemn that proposal.

In reviewing the evidence brought before them the committee dwell especially upon the statements made by witness in relation to wheat production. They point out the remarkable development of the Indian export trade in wheat. The quantity of wheat exported from India in the five years from 1876-77 to 1880-81 was only, on an average, 4,544,000 cwt., valued at £1,951,000; whereas, in 1881-82 it was 19,901,000 cwt., valued at £8,870,000; in 1882-83 it was 14,144,000 cwt., valued at £6,060,000, and in 1883-84 it was 20,961,000 cwt., valued at £8,800,000. It is remarked that the cultivators have been induced not only to substitute wheat for less remunerative crops, but also to extend the area of cultivation and to improve their farming; also that, as railways tap fresh districts, more sources of supply are found. In certain districts, too, new railways will open up valuable coal fields and possibly iron mines in a few cases. After noticing the information given by several witnesses as to the improvement of the condition of the people through the development of the railway system, the committee state that they consider the evidences in favor of a more rapid extension of railway communication to be conclusive, and they go on to say that they are of opinion that the amount proposed to be spent on railways by the Government of India during the next six years is moderate and likely to have

very beneficial effects. If the necessary loan can be really raised in India they consider it advantageous so to obtain it; but they appear to doubt the possibility. In conclusion, while expressing an opinion to the effect that the present limit of borrowing £2,500,000 might with safety be enlarged, they think the full responsibility of deciding upon the amount to be borrowed from year to year should rest with the Secretary of State in Council, and they emphatically declare that the proposed extension of railways should not involve additional taxation.

California Iron.

From an interview with Irving M. Scott, of the Union Iron Works, in the *San Francisco Chronicle*, we make the following extracts, which impart some information concerning the iron interests of California:

The furnace plant at Hotelling, Placer County, has a capacity of about 30 tons a day. The fuel used is charcoal, of which there are consumed about 100 bushels to the ton. With other expenses of manufacture, it costs there about \$18 per ton. The selling price of pig iron is about \$25. The freight to San Francisco is \$2.75 per ton, which, added to \$18, the cost, makes \$20.75. There are 177 men employed, and they distribute in the county of Placer about \$12,000 a month. There are great numbers of iron-ore deposits in the State. There is splendid iron ore found in Sierra Valley, in Shasta, near Napa, in the neighborhood of Sonoma, not far from Los Angeles, in San Bernardino County, and elsewhere in the State. There are also great deposits in Oregon and Washington. There is plenty of ore everywhere, but, unfortunately, a lack of fuel. The iron interests of California have much to prevent their rapid development, and need all possible encouragement.

At present not one pound of boiler-iron plate suitable for shipwork is made on this coast; but the California Iron and Steel Company are putting up a "bloomery" for the purpose of manufacturing plates or making the "blooms" out of which plates are rolled. Any reduction of the tariff that would affect the manufacture of iron would seriously affect the manufacture of plates. Of course all this represents a beginning, but it means the birth of many new industries and the opening of many new avenues of labor. We want to keep the money that is being constantly sent East or abroad in our pockets and circulating among ourselves. We want to see our workmen kept busy. When it is no longer necessary to send east of the Sierra for any of the articles that we need for our daily use, then the transportation question will have been settled forever. Then it will not be so much a matter of what we receive by rail as of what we send away. Then the railroads will be obliged to carry from San Francisco 1000 miles in any direction as cheaply as they now carry the same distance from Chicago or New York.

British Colonial Union.

Some form of federation in which all the dependencies of the Empire shall be represented is taking a larger hold on the British mind. The scheme of "Australian federation," which was to include New Zealand, Tasmania, the Fiji Islands and other outlying domains, is now expanded to embrace territories of both hemispheres. At a meeting in London recently an incipient movement was made toward perfecting an organization with this object for its special aim. Many of the notabilities of the Empire participated in the discussion and a resolution was passed "that in order to secure the permanent unity of the Empire, some form of federation is essential." The Earl of Roseberry, who is prominent in the movement, intimated that delegates from the colonies would be expected to have a place in the House of Lords, "as did delegates in the Senate of the United States." However seductive such a scheme may appear in the minds of its originators, it is already clear that Canadians may object. Says the *Montreal Herald*: "It is not difficult to see to what all this would lead, and especially what it would mean for Canada, whose energies, instead of being directed toward the development of a political and commercial system adapted to its own circumstances, necessities and industries, would be paralyzed by a policy which would be bound to consider the circumstances and wants of 20 other countries, each seeking to control what would be called the Imperial programme."

This editor, who is by no means eccentric in his views, would prefer that the colonies be left as free as possible "to work out their own ideas of self government and self development." Even with the large liberty they already possess, Canadians are restive under the restraint that denies them the right to make their own commercial treaties. Nor may they participate in England's deliberations with reference to commercial engagements elsewhere—for example, in the recent renewal of her commercial treaty with Mexico. Looking to the more important interests represented by Australia, with its "Imperial acreage for a future nation of 50,000,000," there is a natural desire to provide means for united action in their common defense, as well as for the equal advancement of every part. But a scheme comprehensive enough to embrace two hemispheres must contemplate the adjustment of interests that directly antagonize.

A Rich Mineral Find—Ore containing silver, copper and other metals in paying quantities is said to have been discovered in the Blue Hill, opposite Northumberland, Union County, Pa. The mountain is between 300 and 400 feet high, running east and west. Five drifts have been driven in the sides of it, and a vein of ore struck in each. One shaft has been sunk from the top to a depth of 40 feet. The first drift is at the foot of the mountain. Silver and copper ore was found at the surface. It is driven 100 feet and shows the vein of ore sloping or leading to the bed of the Susquehanna River. This ore, under analysis, contains \$19.60 in silver to the ton and 70 per cent. copper.

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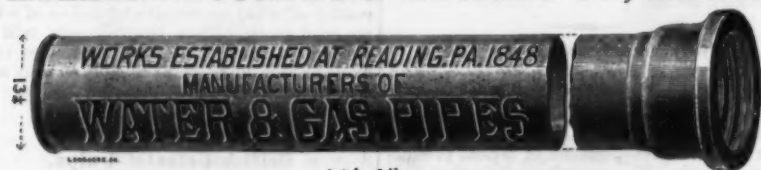
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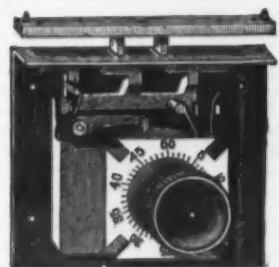
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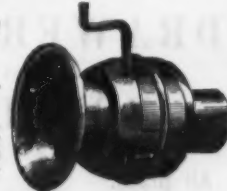


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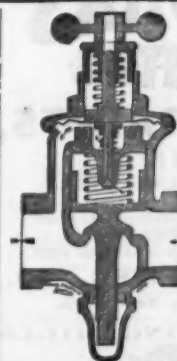
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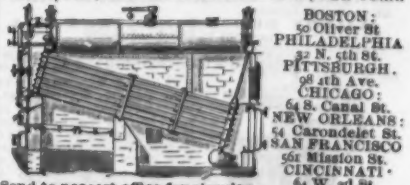
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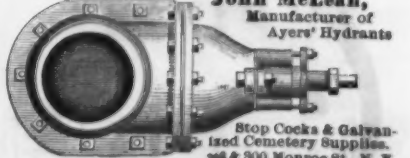
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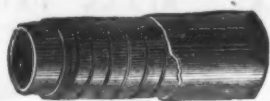
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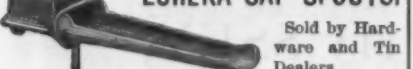
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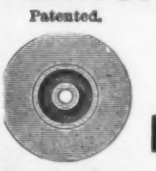


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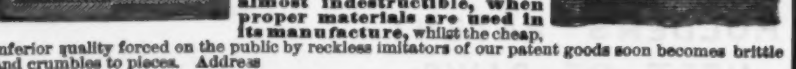
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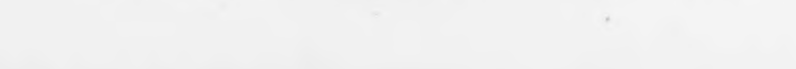
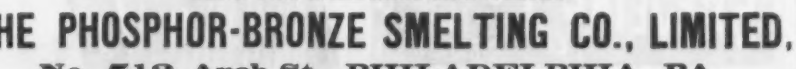
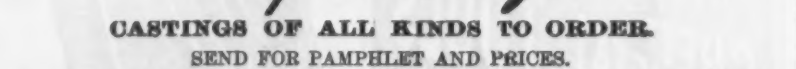
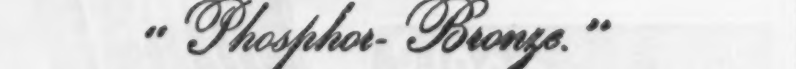
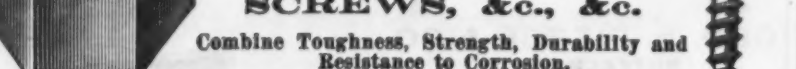
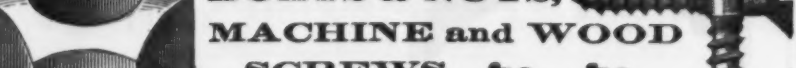
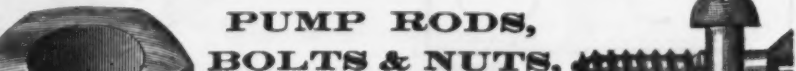
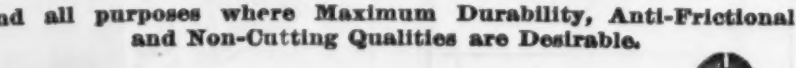
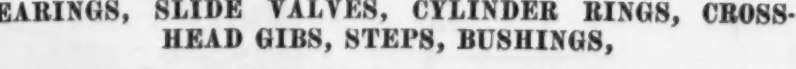
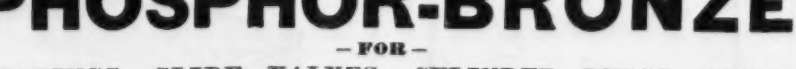
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SCIENTIFIC AND TECHNICAL.

Conductivity of Metals and Alloys.

M. Lazare Weiller, says *Engineering*, has conducted a new and independent investigation into the electrical conductivity of certain metals and alloys, the results of which he lately presented to the Société Internationale des Electriciens. For the purposes of his experiments he caused small bars of metal to be cast of a diameter of about 13 mm. (.51 inch). These were divided in such a way as to show the grain of the fracture, and one part was drawn into wire to be used in the trials. Those alloys which can neither be drawn nor rolled easily, such as silicides and phosphides, were tested directly on the cast bars, after the method of Sir William Thomson. In the trials the bars, fitted with binding screws at each end, rested upon knife-edges at an invariable distance apart. These knife-edges, were respectively in communication with two resistances composed of two parts, of which the one was the thousandth part of the other. The extremity of one was connected to the fixed terminal of a Wheatstone bridge with a sliding contact, and the other to the slider itself. The two points which separated the resistances communicated with the galvanometer. Finally the extremities of the bridge were connected to the binding screws by means of a circuit, which included a battery of four elements and a contact key. The resistance sought was then equal to the resistance measured upon the wire of the bridge, divided by 1000. The measurements, which were carefully and accurately conducted, and were effected on a great number of specimens, were made in part by M. Weiller himself and in part by M. Dufon, in the laboratory of Messrs. Breguet. The results are given in the following table:

1. Pure silver.....	100
2. Pure copper.....	100
3. Refined and crystallized copper.....	99.9
4. Telegraphic silicious bronze.....	96
5. Alloy of copper and silver (50 per cent.).....	86.65
6. Pure lead.....	78.1
7. Silicious bronze.....	75
8. Silicious bronze, with 12 per cent. of silicon.....	54.7
9. Pure aluminum.....	49.2
10. Tin, with 12 per cent. of sodium.....	46.5
11. Telephonic silicious bronze.....	35
12. Copper, with 10 per cent. of lead.....	30
13. Pure zinc.....	29.9
14. Telephonic phosphor-bronze.....	29
15. Silicious bronze, with 25 per cent. of zinc.....	26.49
16. Brass, with 35 per cent. of zinc.....	21.5
17. Phosphor tin.....	17.7
18. Alloy of gold and silver (50 per cent.).....	16.12
19. Swedish iron.....	16
20. Pure Banca tin.....	15.45
21. Antimonial copper.....	12.7
22. Aluminum bronze (10 per cent.).....	12.6
23. Siemens steel.....	12
24. Pure platinum.....	10.6
25. Copper, with 10 per cent. of nickel.....	10.6
26. Cadmium amalgam (15 per cent.).....	10.2
27. Dronier mercurial bronze.....	10.14
28. Arsenical copper (10 per cent.).....	9.1
29. Pure lead.....	8.88
30. Bronze, with 30 per cent. of tin.....	8.4
31. Pure nickel.....	8.89
32. Phosphor-bronze, with 10 per cent. of tin.....	6.5
33. Phosphor copper, with 9 per cent. of phosphorus.....	4.9
34. Antimony.....	3.88

The resistances are not given in ohms, but as proportions to a given body. They may be reduced to the conventional standard on the assumption that a wire of pure silver 1 mm. in diameter has, at a temperature of zero Centigrade, a resistance of 19.37 ohms per km.

Soldering Aluminium.

The use of aluminium in the arts has been much restricted by our ignorance of any method of soldering it, either to itself or other metals. Now, however, a French engineer, M. Bourbouze, has discovered a way of soldering it. The process consists in plating both surfaces to be soldered, not with pure tin, but alloys of tin and zinc, or, what is better, tin, bismuth and aluminium, &c. Good results are obtained with all such alloys, but those containing tin and aluminium are best. They should contain different proportions, according to the work the soldered parts have to do. For parts to be fashioned after soldering, the alloy should be composed of 45 parts of tin and 10 of aluminium, as it is sufficiently malleable to resist the hammer. Pieces thus united can also be turned. Parts which have not to be worked after being soldered may be united with a soft solder of tin containing less aluminium. This last solder can be applied with a hot soldering iron, as in soldering white iron, or even with a flame. Neither of these solders requires any prior preparation of the pieces to be soldered. It suffices to apply the solder, and extend it by help of the iron over the parts to be joined. When, however, it is desired to solder certain metals with aluminium, it is best to plate the part of the metals to be soldered with pure tin. It is sufficient then to apply to the part the aluminium plated with alloy, and to finish the operation in the usual manner.

A New System of Telegraphy.

Signor Michela, an Italian, has devised a new system of telegraphing known as the steno-telegraph, by which words may be transmitted with far greater rapidity than by the present system. The aim of Signor Michela is to telegraph by means of a keyboard instrument any speech, no matter in what European language, at the same speed as it is delivered, or at the rate of 10,000 words in an hour. Michela's apparatus has been in use in the Italian Senate, and an account of which has been written by M. Casagones. Michela's machine works on the phonetic principle, and depends mainly for its success on the ability which the inventor has disclosed in grouping into series, all the phonetic sounds emitted in any language. As soon as the operator hears the words, he divides them into sounds, and prints their graphic representations in short horizontal lines on a paper band about 1 1/4 inches wide. That is a stenographic record, but also at the same time the signs are being printed on the paper they may be telegraphed to a distant station. The machine consists of two parts—the printing mechanism and that for the automatic forwarding of the paper. The latter is of no special character, but the printer consists of two keyboards having 10 keys each (6 white, 4 black); these keys press on 20 studs which are, by a system of levers, connected to as

many styles, which carry the signs or characters to be imprinted on the paper. It is stated that a skilled operator can take down with Michela's apparatus 200 words per minute in any language he knows. For something like three years, it is reported, the system has stood the practical test, so far as stenography is concerned, and now the machine has been connected electrically with an apparatus for transmitting the signals to a distant station as fast as they are made, so that, if the receiver can translate the steno-telegraphic signals with rapidity, a speech might be read at the distant office as fast as the speaker himself delivers it. It is better to keep each machine for its own special work—that is, the receiving instrument should not be used as a transmitter, nor the transmitter as a receiver. The receiver, in fact, has the printing styles, but not the keys, the styles being actuated by magnets excited by currents sent from the transmitter. This arrangement has been adopted because the machine could be made lighter or to require less force to actuate it, and because the use of a combined transmitter and receiver would have interfered with quadruplex and multiplex working. Without details of the mechanism, it is sufficient to explain that each key may be considered a true Morse key, and the board, therefore, represents a set of 20 Morse instruments, which combined, according to Michela's stenographic method, give a transmitting speed much higher than that of any existing telegraph.

Economy of Cable-Towing.

The following observations on the economy of cable-towing, by Prof. K. Teichmann, were translated from a German paper and republished in the Abstracts of the British Institution of Civil Engineers: The essential feature of this system of traction is a cable (chain or rope) fixed at both ends of the route to be traversed, and passing over a steam winch attached to the tugboat, which picks up the cable in front of the ladder, and drops it again after by means of guide-pulleys, hauling along the vessel and barges attached to it. The chief advantage of cable-towing, as compared with screw or paddle-wheel propulsion, consists in the avoidance of slip and consequent waste of power. The latter is especially great in the case of tugboats, and is much increased when the motion is against the stream. From experiments made with both classes of vessels on the Rhine, under circumstances as nearly as possible identical, the relative consumption of fuel up stream was 1 to 4 1/2 in favor of the cable boats, the average ratio up and down on the middle Rhine being as 1 to 3 1/2, and this in spite of the paddle-boats having more economical engines. Against the greater economy in fuel of the cable system must be set the very considerable expenditure for first cost and maintenance of the cable itself. Two kinds of cable are practically in use, chain and wire rope, and the author gives particulars as to the strength, weight and cost of both classes of cable, and their relative safety in actual working. The result is in favor of the wire rope, although the durability of the chain is greater. The annual cost of the chain is 1.8 times to 2.3 times as great as that of wire rope under similar conditions. A further advantage of cable-towing, as compared with paddle or screw propulsion, lies in the greater security and speed of the former against rapids, as a paddle tug with a given power and train of barges will come to a standstill against a current of 3 m. velocity, while a cable tug, under the same circumstances, would advance at half speed. In order to make an accurate comparison of the two systems of propulsion, the author assumes four waterways, in which the velocity of the stream is respectively 2.4, 1.6, 0.8 and 0 m. (7.872, 5.248, 2.624 and 0 feet), and calculates the performances and cost in each case. This is done for both chain and wire-rope cables. The relative economy of fuel for the cable system is, of course, much greater where the velocity of the stream is high than in still water, and, in order that this saving may balance the greater expenditure for first cost and maintenance at a given price of fuel, a certain number of trips will in each case be necessary. Taking the price of fuel at 11 marks (approximately 11/7 per ton), the number of these trips in the four waterways previously referred to will be, for a wire-rope cable, respectively 205, 305, 479 and 866; for a chain cable, 475, 646, 928 and 1573. The only advantage of the chain as compared with the rope is that it can be used in shallow water where wire rope could not be applied. The steering capacity of the chain cable tugs is less than that of those with wire ropes. This is owing to the cable being taken off at the side of the vessel in the latter case, while the chain passes directly astern. Very sharp curves are traversed by the cable tugs on the upper Rhine, one of these above St. Goar having an angle of 90°, and 80 m. (262 feet 5 inches) radius. The author gives the results of the experiments and calculations referred to in a tabular form.

Another Elevated Railway Projected in Brooklyn.—Mayor Low, on the 23d inst., signed the resolution of the Board of Aldermen, passed August 17, conferring the right upon the Brooklyn and Long Island Cable Railway Company to build an elevated road from the Brooklyn Bridge and South Ferry to the city line. The road will be built jointly by the Long Island Railroad and the Atlantic Avenue Railroad companies, and the preliminary steps in its construction are to be taken at once. "If everything goes as we expect," said Austin Corbin, "we shall have the new road in operation by a year from this fall. It will connect directly at the bridge and at South Ferry with the elevated roads of New York, and will be similar to them in nearly every respect, except that we shall run by cable. The length of the road will be 5 miles. This will bring the suburbs of Brooklyn within 30 minutes of this city, and will develop property all the way to East New York. It is an important step in the development of the scheme to establish a new line of ocean steamers to land at Fort Pond Bay, at the end of Long Island, which will make a saving of two days and 15 hours over the average present time occupied in a European voyage."

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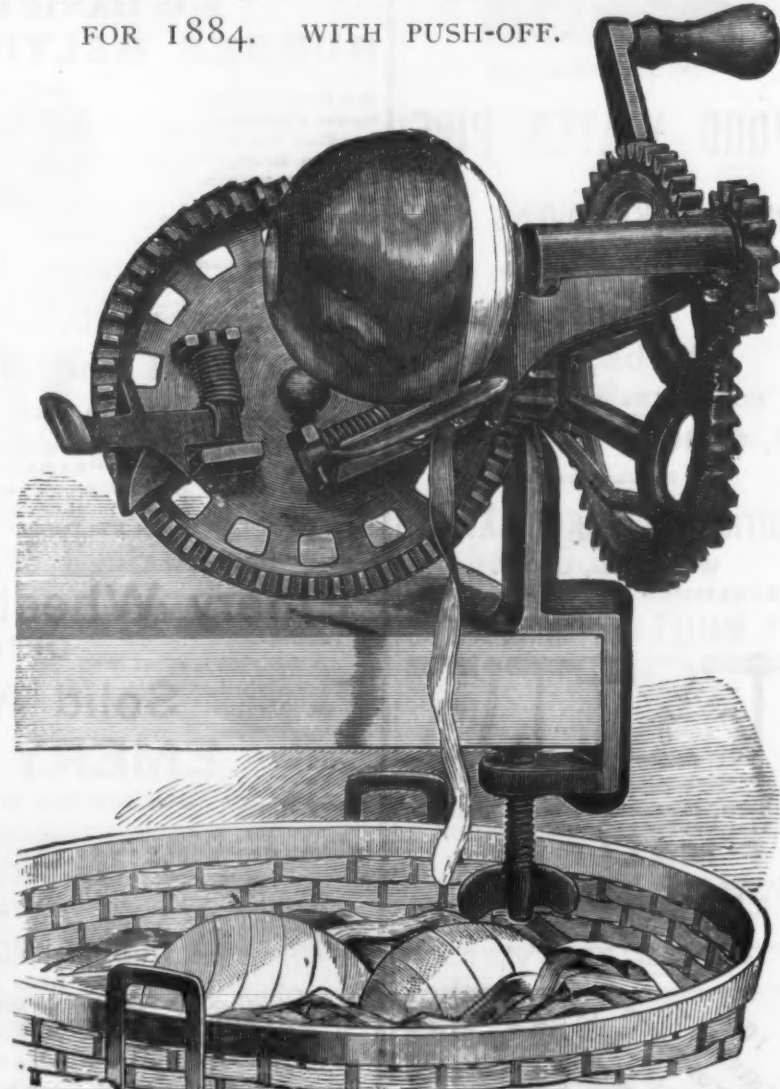
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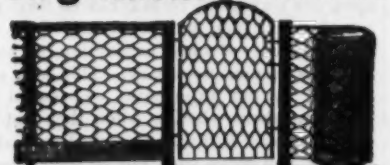
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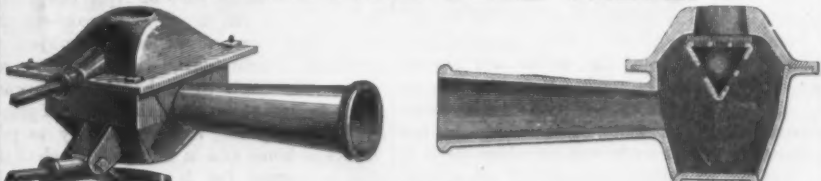
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New Inventions.

In a wheel-hoe patented by S. Fuller, of Danvers, Mass., a pair of weeder or hoes can be independently or simultaneously adjusted in a direction at right angles to the line of travel while the machine is traversing the ground. The frame of the machine consists of two longitudinal bars, under each of which runs a rod provided at the upper end with a suitable handle. At the lower end each rod is connected to a weeder bar that is made in one piece with a bent or curved weeder. The operator can, by the handles, bring the weeders closer or further apart to avoid obstructions or to weed larger or smaller plants.

The Thorn Wire Hedge Company, of Chicago, Ill., have procured the exclusive right in a new twister and spooler for the manufacture of wire fencing. The machine twists or spins two or more strands of wire together and winds the twisted wire upon a spool, and is especially designed to be employed in the manufacture of wire fencing. The frame of the twister carries two disks, which hold the spool between them. One disk has a central axial aperture, through which the movable spool-shaft freely passes, and which allows the disk to adjust itself inwardly against the end of the spool. The other disk is locally stationary—that is to say, it has no movement except a rotary one upon its axis. This disk is rotated by suitable spur-gear connections.

A new article of tableware patented by L. Chevalier and L. Graillet, of Paris, France, is adapted to grasp the bone of a cutlet, a leg of chicken or the like. The device consists essentially of two grooved grasping jaws, which are attached each to a spring blade. These blades are riveted at their ends, and act to hold the jaws apart. A sheath or hollow tube encircles the blades. By a finger piece the blades may be pushed to any desired extent into the sheath and locked in position. The further the blades are pushed into the sheath, the closer will the jaws come together. They may be thus made to firmly grasp the article placed between them.

A coating for wire to be applied preparatory to drawing consists of a solution of dextrine and alum, mixed with flour or meal. The proportions used are 1 to 2 pounds of dextrine, and from $\frac{1}{2}$ to $\frac{3}{4}$ ounce of alum to each 100 pounds of flour. This coating, it is claimed, flows evenly over the surface of the wire and sets quickly. It therefore does not run to the under side of the wire in drying, and produces a better lubrication. B. F. Aiken, of Millbury, and C. W. Newhall, and George W. Ellis, of Worcester, Mass., are the patentees of the above solution.

A warning plate for wire fences, patented by S. Forrester, of Allegheny City, Pa., is so constructed that it may be seen from every direction. As now generally made, these plates are flat and are only useful when a view of their faces is presented, while when accidentally turned they become nearly invisible. The blank of the new plate is, by two peculiar cuts, divided into two sections, each section having a portion of its body on each side of the connecting line. Thus made the plate is inserted between the strand wires, and the latter are twisted into notches formed on opposite sides of the plate. The sections are then bent until their planes are at right angles to each other. The plate will now present faces in four different directions, and, by indenting their salient edges, they may be also used as barbs.

A metallic fence in which wire and metal strips are interwoven is made as follows: First, two horizontal wires are stretched, and the diagonal wires are attached to the upper and lower wires, respectively, and crossed and recrossed to form the usual diagonal filling. At the several points where the diagonal wires are twisted around the horizontal wires barbed slats are woven in, which slats form the uprights of the fence. D. A. Roach, of Crawfordsville, Ind., has patented this fence.

A new carpet stretcher consists of two curved pointed arms, joined together and connected at the joint with a third arm, ending in a toothed stretching jaw. The pointed arms are first thrust through the carpet, and give proper bearings for the toothed arm, which is made to grasp the carpet between them and push it toward the wall. This stretcher is patented by J. A. Dunnell and A. Smith, of Boston, Mass.

R. H. Beach, of Flint, Mich., is the patentee of a forging machine for forging a variety of small articles. In this machine a heated piece of iron is first pressed between registering dies secured to a plunging mandrel and stakes, and is then trimmed off by a similar operation between another die and a punch. By doing away with the blow of the plunger or hammer, and substituting pressure therefor, chilled dies may be used, which are much cheaper than the cast-steel dies used to withstand the heavy blow from a hammer. Another advantage of this machine is that it combines both the forging dies and trimming dies, and avoids thereby much unnecessary handling.

A hay, manure or like fork, with removable tines, has been invented by G. Pickhardt, of Westphalia, Germany. Each tine has an enlarged end or shank with beveled edges and made tapering from the tine outward. The shanks fit into tapering dovetailed grooves formed in the rear side of the fork-head. In this manner the tines can be firmly secured to the head, and to prevent their accidental dropping out they may be locked by striking the flat face of the tines a blow or two with the hammer, to slightly spread and wedge the shanks in the grooves. The tines may be removed at any time by simply striking their projecting ends with a hammer. If desired, set-screws may be employed for securing the tines more perfectly in position.

The Rogers Fence Company, of Springfield, Ohio, are the patentees of an improved iron fence, made with double horizontal rails and without any ornamentation. The upright picket rods are square in cross-section and are inserted between a pair of horizontal rails also square in cross-section. Between every two upright there is a spacer consisting of a bar of the requisite length. The spacer is made narrow, with its vertical diameter much the greatest. At each end it

has an angular fork which straddles one of the corners of the uprights, and in the rear of this, upon either side, is a laterally-extending spur or lug which inclines downward. To secure the spacer, uprights and rails together a clip-band is used, which is applied over the middle of the spacer bar.

A hand-saw invented by C. A. Fenner, of Mystic River, Conn., is so arranged that, if the handle is turned, a positive revolving motion is imparted simultaneously. This is of importance in such operations as marqueterie sawing, where it is necessary that the saw blades shall be turned in various directions while the operation of sawing progresses. The saw consists essentially of a frame, two spindles having their bearings in said frame, the saw blade secured to said spindles and chain mechanism for connecting the handle to the opposite spindle.

H. A. Schwelbe, of Chicago, Ill., has patented a carpet fastener which consists of a hook that is sewed to the under side of the carpet. The end of the hook is provided with a hinged extension, which may be folded back. The hook is first inserted into an eye screwed into the floor, and the extension is then turned in, so that the hook cannot be accidentally displaced. This fastener is also well adapted to stair carpets. An advantage claimed is that in using it the carpet need not be stretched unduly, as is the case with many of the old fasteners.

A shovel of the kind having a long straight handle has been patented by F. W. Hudson, of Leominster, Mass. The object of the invention is to prevent tipping of the blade, whether the handle is grasped high or low. For this purpose the handle is provided at its lower part with a rib in front and at its upper part with a rib in the rear. These ribs allow a firm grasp. They are arranged in this peculiar way in order to prevent the loaded blade from pressing the ribs into the hand.

An improvement in sheep shears made by W. F. Wickenden, of San Luis Obispo, Cal., relates to a device for holding the blades apart during grinding. This class of shears is made so that the blades remain normally open, but not open far enough to permit grinding. The present custom to accomplish a wider separation is to insert a cross-stick between their shanks. But this stick is liable to become loosened, and the blades being released come together and frequently cut the hand of the operator. In order to overcome this difficulty the inventor pivots a brace-rod at one end to the shank of one of the blades. The free end of this rod fits into a recess or socket on the shank of the other blade. When the brace is free it lies within that shank to which it is pivoted, and is out of the way, but when it is extended it holds the blades wide apart. The brace is prevented from swinging loose by a spring which bears against it.

G. Freund, of Durango, Col., has invented a pocket-knife for miners' use, to facilitate the cutting and capping of a fuse and for similar purposes. One of the blades is provided with a screw-threaded recess. The handle case has two notches, of which one, which is near the end of the handle case, is deeper than the other. If a fuse is to be cut it is placed into the last-named notch, and the blade is folded down to cut off the fuse. The end of the fuse is then placed into the first notch after the blade has been raised, and then the blade is again folded down, and thereby presses a thread into the end of the fuse. The knife is also provided with a spoon blade for digging out giant-powder candles to receive the fuse.

A new barbed wire is made with U-shaped collars slipped over and clamped to the strand wires. The collars are made with one flattened surface, and the barbs are coiled on the strand wires and over the collars in such a way that they lie diagonally across the flattened surface of the collars. The prods of the barbs are then coiled back in opposite directions, forming a neat and compact two-point barb. The flattened part of the collar prevents any rotation of the barb on the strand wires, while the collar itself prevents lateral motion of the barb. A patent for this construction has been granted to C. B. Brainard, of Joliet, Ill.

A tack hammer with a hollow handle to receive the tacks is a novelty lately patented. The mouth of the handle is closed by a spring plug which is readily removed. The hammer is well adapted for household use, and does away with the employment of a separate receptacle for holding the tacks. It is the invention of G. S. Yingling, A. D. Flack and H. T. Heller, of Tiffin, Ohio.

A kerf clearer for saws, invented by J. Smith, of Philadelphia, Pa., consists of a strip of metal which is adapted to the throat of the tooth and is fitted at each end into a slot in the blade. The strip is made of steel, and possesses slight elasticity. It is applied by first contracting it, then slipping the ends into the slots and finally releasing it, and, being wider than the retainer is thick, presents two ribs which clear away the sawdust. Heretofore it has been the practice to swage the concave edge of the retainer in the throat of a tooth, so as to form on each side a rib for clearing away the sawdust. This swaging is a tedious and costly operation for which the patented clearer is claimed to be an economical and effective substitute.

The celebrated Egyptian explorer Petrie has just discovered a colossal statue of Ramses II, which, when whole, must have been the largest stone statue ever known in the world, its altitude from foot to crown having been 95 feet. It was a standing figure of the usual type, wearing the crown of Upper Egypt, and with its pedestal had an extreme height of 115 feet. It was a monolith and came from the quarries of Syene, like the great obelisks and pillars of Luxor, and, according to the most careful computation, it must have weighed about 700 tons. It has been mutilated and despoiled beyond recovery, and its fragments built into the propylon of a temple erected by the sovereign of a later dynasty.

According to a cable dispatch from London, dated August 20, Postmaster-General Fawcett has informed the various steamship companies that the present arrangements for carrying the mails to New York will be continued for another year.

rail, placed on bearings 3 feet apart, and that the steel of which the rails were made was to endure a tensile strain of 80,000 pounds to the square inch. These specifications were regarded as quite extraordinary, and the president of one steel-rail company informed the railroad company that he was not a manufacturer of boiler plate, but of steel rails. However, a steel-rail company was found that had the pluck to take the contract with all its difficulties, and we are informed also that they filled it satisfactorily. When rails are made at low prices to stand such a test, it is evident that there is no great deterioration in quality.

Why England Lost an Indian Contract.

It will be remembered that a recent adjudication of contracts for axle-boxes for India by the British Government to a foreign firm was the cause of a good deal of a breeze in England. Demands for a statement of the tenders were loud and persistent. Such a demand, and the withholding of the information, are matters that Americans can hardly understand, as with us such tenders are opened in public, and not only the names, but the specific bids, of all parties bidding are known to all other bidders and the public. As the result of the demands of the English iron manufacturers, however, the six tenders for the 800 axle-boxes (meter gauge) have been given to the public, and are as follows:

	£	s.	d.
Tender No. 1.....	0	12	6
Tender No. 2.....	0	14	3
Tender No. 3.....	0	15	9
Tender No. 4.....	0	18	1
Tender No. 5.....	1	6	4
Tender No. 6.....	3	0	0

The difference in the first four bids is no greater than would be expected in a tender of this kind, but the margin between 12/6 and 6/0, the amounts of tenders numbered 1 and 6, is so great that it would seem possible to explain it only by the supposition that some mistake had been made. The first bid, that of 12/6, which was by a foreign axle-maker, was accepted. Subsequent demands for 920 axle-boxes (meter gauge) brought out a bid 4d. lower. The *Ironmonger*, in commenting upon these facts, says: "The 'broad facts, as now first elicited, are before the trade, however, and our manufacturers are able to see exactly how much they were underbid by their Continental competitor. For anything we can see to the contrary, the India Office could not well have decided in favor of home firms while a much lower offer was before the department. All that British manufacturers are entitled to ask for is that the conditions of the specifications shall be strictly adhered to, and the goods examined in the same manner as they would have been had the axle-boxes been manufactured in this country."

Trade With China.

One of the most intelligent of European observers, who has recently spent much time in China, including three months in Tonquin, is convinced that the "Flowery Kingdom"—sometimes so called—has a great future before it, and, "commercially, offers the 'biggest and most fruitful field in the Far East to a manufacturing nation like England." The writer might have as appropriately added, "or the United States," which not only manufactures cotton, but produces, as well, enormous quantities of the raw material suited to the Chinese market. Not only so, but the United States might export with equal facility hardware, implements and household utensils in endless variety, in exchange for silks and teas. With a growing possibility, which the events of each day make more certain, that China may soon become accessible, through the forcible breaking down of her exclusive policy in respect to foreigners, such a field as that presented by the Celestial Empire must offer to all manufacturing countries a strong attraction. The present Empire of China extends over 61° of longitude and 34° of latitude. The total area is some 4,500,000 square miles, of which the 18 provinces of China proper, including the islands of Hainan and Formosa, constitute about one-third. The Empire includes, besides the 18 provinces, Manchuria, Mongolia, Kuldja, Kashgar, Koko-nor, Tibet and Korea. Annam is yet in dispute, terrorized by French cannon. China proper, as just described, comprises about 1,350,000 square miles, equal in area to seven countries like France or 15 of the size of Great Britain, and the population is computed at 300,000,000.

Without attempting to debate the subjects now in controversy between the prospective belligerents, we seem warranted in jumping at the conclusion that China, however well equipped in Krupp guns and improved weapons, can never withstand the blows that France seems ready to inflict. True, she has eight arsenals, several of which are filled with gun-making machinery after the American pattern, her forts are strongly defended, and she has a powerful naval armament, to which the shipyards of England and Germany have contributed a fleet of iron-clads of the latest model. More specifically speaking, China has three separate fleets. The Canton fleet comprises 12 gunboats, of which nine were made in England and are in charge of English officers. The Fu-kiang fleet is composed of six gunboats and a few transport vessels; these were made at Foo-Chow, under the supervision of Frenchmen, and are in charge of Chinamen. The Shang-

hai fleet is composed of nine gunboats, two frigates and several transport vessels, all made by Chinamen and rather insignificant. Recently China has got from England eight ironclads, armed with guns of the largest caliber. The most effective part of the Chinese fleet is made up of 13 small steel gunboats of 1350 tons displacement and propelled by twin screws. They each carry two 26-ton 10-inch breech-loading guns mounted upon center pivots, one forward and one aft. The vessels are also armed with a formidable steel knife-edge spur or ram.

French interests in China, notwithstanding the loftiness of her pretensions, appear insignificant in comparison with those of Great Britain. A writer in the *Economist* *France* of a recent date is apparently surprised to find that French interests are comparatively limited. From the figures he gives it seems that the importations into China from France in 1880 were valued at just over 100,000,000 francs, while those from England were estimated at 325,000,000 francs. The exports to France from China were worth scarcely 3,500,000 francs, while the exports to England reached a value of 235,000,000 francs. It also appears that in 1882 there were 289 English commercial houses in China, and only eight French, although Germany had as many as 50, and America 21. The returns of British traffic for the year 1880 were as follows:

	Imports.	Exports.	Total.
Great Britain.....	\$30,195,000	\$38,000,000	\$68,195,000
Hong Kong.....	41,475,000	22,900,000	64,375,000
British India.....	28,575,000	1,548,000	30,123,000

The foreign and coast trade, according to the Chinese customs returns for 1882, consisted of 17,388,852 tons, 61.47 per cent. of which was borne by English vessels, while China took 26.16, Germany 3.85, France 3.55, America 0.92, and Japan 1.81. The total value of the foreign trade was, in round numbers: Imports, \$112,750,000; exports, \$97,800,000. It is claimed that England, with the aid of her colonies—India, Australia, Hong Kong and Singapore—and the markets of Africa and America, has absorbed four-fifths of the whole trade done by China with foreign countries.

Our own exports to China during the fiscal year ending June 30, 1883, amounted to \$4,080,000, representing manufactured cottons, petroleum and flour, while the imports were \$24,200,000. No inconsiderable part of our balance is settled through commercial houses in England, and it is more than half suspected that large quantities of American loom products, exported ostensibly on English account, are in fact destined for the Chinese market, although by some hocus pocus the American labels are occasionally displaced by the imprint of Manchester. Thus far our trade experiences only a slight disturbance, as the new tea crop has already arrived or is at the present time en route. Conversation with our merchants elicits the fact that they are not anticipating protracted hostilities, even should war be formally declared. Mr. Everett Frazier, Consul-General for Korea, surmises that an adjustment of differences may come about through the friendly interposition of Germany. In any case, it is not thought probable that France would be permitted to interfere seriously with European traffic at treaty ports, especially as she disavows any intention of doing so.

Notwithstanding all sorts of precautionary measures, many of which are enforced by State laws, mining continues to be attended with great loss of human life. In endeavoring to subdue a fire in a Pennsylvania anthracite coal mine, last week seven lives were lost in consequence of the noxious gases generated by the burning coal. This is a horrible calamity, but, shocking as it is, possibly only a few days will elapse until a fresh occurrence of the kind, either in this country or abroad, will take its place in exciting our sympathies. It is quite likely that even greater care can be exercised in conducting underground mining operations than is contemplated by the most stringent laws yet enacted. A commission is now in existence, charged with the duty of taking the testimony of practical miners in Pennsylvania for the purpose of forming a basis for additional legislation on this subject, and it is earnestly hoped that their report may suggest the establishment of such regulations in the management of mines as will prevent the appalling loss of life which now characterizes this dangerous occupation. If Pennsylvania secures immunity from mining catastrophes, other States will speedily follow in her footsteps.

We have read with interest the annual report of Henry E. Hawley, president of the Importers' and Grocers' Exchange, of this city, which was presented at the annual meeting of that body on the 20th inst. He says that the establishment of this exchange has been of the greatest advantage to the tea trade and also to the consuming public. By furnishing a recognized title of value on which to base quotations, it has had an important influence on foreign markets, and importers now purchase teas in the East at prices on a parity with those ruling here. Mr. Hawley says that teas have been bought at reasonable figures, and he estimates that the difference saved to importers this year over last has been about 3 cents per pound on the settlements made, which amounts in the aggregate to \$1,000,000. Three cents per pound less in prime cost is equivalent, he says, to 10 cents a pound less in cost to the consumer. The exchange has therefore saved to the consuming public over \$3,000,000.

It may be possible that this estimate is imaginary, as the consumers may not be able to secure this full saving, but the effort to secure such results is certainly a novelty in the line of exchange transactions.

The approaching meeting, at Montreal, of the British Association for the Advancement of Science is attracting to this Continent many gentlemen, variously distinguished, who in several instances will avail themselves of the opportunity to visit the principal American cities. This will be the first instance in which the anniversary has been held in one of the colonies, and Montreal doubtless feels itself highly honored. Few other kindred institutions have in their membership so many names illustrious in the annals of science, among them Professors Huxley and Tyndall and Prof. Henry E. Roscoe, whose investigations of the chemical action of light has gained him much renown. The president for 1884 is Lord Rayleigh, Professor of Experimental Physics at Cambridge University. The objects of the society are defined to be "to give a stronger impulse and a more systematic direction to 'scientific inquiry,' and among the results attained within the last half century, as recently stated by Sir John Lubbock, are the correlation of physical forces and the conservation of energy, spectrum analysis and its application to celestial physics, the innumerable applications of science to practical life—as, for instance, in photography, the locomotive engine, the electric telegraph, the spectroscopic, and most recently the electric light and telephone. We predict for those gentlemen who visit 'the States' a cordial welcome.

OBITUARY.

JOHN LEISENRING, OF MAUCH CHUNK, PA.

At Mauch Chunk, Carbon County, Pa., on the 22d inst., Mr. John Leisenring died, aged 65 years. Bright's disease being the immediate cause of his death. Mr. Leisenring was born in Philadelphia in 1819, and went to Mauch Chunk in 1828. At 17 years of age he was a civil engineer, working under the late Asa Packer. He assisted in building the Belvidere Delaware Railroad, as well as the first railroad from White Haven to Wilkesbarre, the Morris Canal and the Lehigh Coal and Navigation Company's canals; but his masterpiece of engineering was the construction of the iron bridges crossing the Lehigh and Delaware rivers at Easton, Pa. He was one of the first to engage extensively in the coal business. He organized many coal companies, and was president of several. He built the famous Switchback Railroad to convey coal mined by himself and others. In 1859 he was superintendent of the Lehigh Coal and Navigation Company. He was a director of the Central Railroad Company of New Jersey and president of the Connellsville Coke and Iron Company. In 1844 he was married to Caroline Bertsch, whom he survived with four children, named E. B. Leisenring, of Audenried; Mrs. Dr. Wentz, Jr., of Jeddo; Mrs. M. S. Kemmerer and John Leisenring, Jr., of Mauch Chunk. Mr. Leisenring was of a generous, kind-hearted nature, and an ardent public-spirited man. His acts of charity and beneficence will long be remembered in the vicinity of Mauch Chunk. Mr. Leisenring had accumulated great wealth, leaving an estate valued at nearly \$3,000,000.

A New Idea in Steel-Rail Making.

WASHINGTON, D. C., Aug. 18, 1884.

To the Editor of The Iron Age.—DEAR SIR: Your article on page 11, August 14, on producing steel rails, leads me to call attention to the possibility of which I have long thought, of producing bars and rails directly from the Bessemer converter by a process derived from that by which lead bars and lead pipe are pushed through a die in a semi-fluid state. This lead-pipe manufacture is an extension of the process of drain-pipe manufacture, in which plastic clay is forced through a die, and while looking at the Bessemer plant in operation years ago it occurred to me that power to express the plastic, pasty Bessemer steel could be obtained by closing the converter at the proper instant and forcing into it a quantity of water, just sufficient by its turning into high steam to do the work required. True, it would require nice adjustment of quantity and immense strength in the converter to resist the pressure, but, when we see what progress has been made from the rude Catalan hearth to the train of rollers and the Bessemer converter, we cannot set limits to the achievements of the next generation in its dealings with the metals of general use.

Yours truly, M. C. MEIGS.

The American Shipbuilding Company.—A Philadelphia paper of recent date says that this company has been for some time in the hands of Receiver ex-Commander Gorringer, the former president of the company, who is engaged in completing the contracts taken by the company. The following work remains to be done: A large passenger steamer for the Merchants' and Miners' Transportation Company, of Baltimore, a companion vessel to the *Fraserburg*, built at the yard and recently put in service. A steamer for the Barney Dumping Barge Company, of New York. A small steamer for use in Mexican waters is nearly completed, and will soon be delivered. About 600 hands are now employed. It was stated at the office recently that upon closing up the business of the American Shipbuilding Company, Mr. Gorringer intends to organize a new company upon a plan he has now under consideration. The new organization, it is stated, will enter into business under very favorable auspices, with Mr. Gorringer at its head. It is thought the new company will be ready for organization in about two months.

WASHINGTON NEWS.

(From Our Own Correspondent.)

WASHINGTON, D. C., August 26, 1884.

THE HEWITT BILL AND RANDALL.

Among the unpublished facts connected with the tariff question in the House is a conference between Mr. Hewitt and Mr. Randall, in which the former strongly urged the merits of his bill as a compromise measure after the defeat of the Morrison bill. Mr. Randall finally agreed to give the bill an opportunity to be discussed in order to test the sense of the House. With this assurance Mr. Hewitt again urged his bill upon the Committee of Ways and Means, presuming that it would meet with no further opposition. At the last moment, however, Mr. Morrison, the chairman, interposed his objection to the report of any other bill since his own had been so ruthlessly handled by members of his own party. As a compromise, after much persuasion he did consent to a report of the administrative portions of the Hewitt bill, which will doubtless be the end of the tariff for this Congress.

TORPEDO EXPERIMENTS.

The report of experiments in torpedoes as a means of harbor defense at the torpedo stations at Millets Point and Newport shows very satisfactory results, and the appropriations for the present fiscal year will enable the officers in charge to go on with this important branch of warlike defensive appliances. The experiments during this year will be in submarine movable torpedoes propelled and controlled by power, operated from shore stations to be selected by the Board of Engineers U. S. A.; also in improvements and test of motors for movable torpedoes, and trial of submarine mines for harbor defense. The experiments in the use of torpedoes and practical instruction of engineer troops in the details of this branch of the service have been attended with beneficial results. The progress made in the army and navy and by inventors in civil life in offensive and defensive arms, ammunition and explosives and the apparatus for their military use has, upon the whole, been more advanced than by foreign Governments. It is shown that, while those Governments run to long range great guns, the American experiments have been directed to more effective appliances of offensive and defensive war.

DECISIONS IN CUSTOMS CASES.

The Treasury Department has recently promulgated the following decisions: So-called "pocket necessities," consisting of a corkscrew, button-hook and nail-cleaner, of iron or steel, put up in such a manner as to fold together, were properly classed as manufactures of iron and steel.

The coloring and glazing of paving tiles does not so change their condition as to remove them from the category of "paving tiles," and they are therefore dutiable at the rate of 20 per cent. ad valorem under T. I. new, 130.

A vessel in the course of construction, not documented, is not entitled to the privileges of Section 16 of the Shipping act of June 26, 1884, relating to the withdrawal of supplies free of duty.

ENTRIES ON THE FREE LIST.

The Treasury Department issued the following circular on the 20th inst.:

The free list of the tariff act of March 3, 1883, exempts from duty "articles imported for the use of the United States, provided that the price of the same did not include the duty." This department perceives no objection under authority of this law to the purchase in bond for the use of the United States at a price which does not include the duty of merchandise already imported, but which has not been delivered from custody of the customs officers. The practice has obtained, however, in some cases, of Government officers purchasing goods on which the duty had been paid, and which had been delivered from custody of the Government with the agreement that free entry would be granted for a like quantity of similar merchandise to be imported and delivered to the contractor to replace the goods previously delivered to the Government officer making the purchase. It is deemed proper, therefore, to state that this Department regards such transactions as not warranted by the law, and that hereafter free entry will not be granted for articles imported to replace others bought from duty-paid stock previously delivered into private hands. Requests from the various executive departments for free entry of articles purchased for the use of the same should give a detailed statement of the contents of the packages and the name of the officer of the Government to whom the articles are to be delivered. It is considered desirable to avoid, as far as possible, the delivery of such merchandise into the hands of private parties.

Phosphorus in Charcoal Pig Iron.

The following translation by Mr. J. Westesson, for the Journal of the United States Association of Charcoal Iron Workers, is from a paper by Dr. Adolph Tamm, in the *Jernkontorets Annaler*: It has long been noticed that the amount of phosphorus in pig produced in charcoal furnaces (of Sweden) from ores containing a very small percentage of phosphorus is greater than that which corresponds to the amount in ores, even supposing that all the phosphorus went into the pig iron. The phosphorus determinations that I have made during the past 11 years of the best brands of Swedish pig iron have, generally, shown about .01 per cent. more of this element than could be calculated from the amounts of iron and phosphorus in the ores. If, therefore, pig iron "reguli," produced by means of crucible assay, and tested for phosphorus, gave results differing very little from the calculated ones, it would not only show that the analyses of the amounts of phosphorus in the ores was correct, but would also indicate that the excess of phosphorus obtained in pig iron made from the same ores in blast furnaces must have originated from the charcoal. In the crucible assay, part of the charcoal comes in contact with the charge, whereby the percentage of phosphorus in the "regulus" may be somewhat increased, but the amount of

charcoal consumed in the crucible by the ore is very small in comparison with the quantity consumed in the blast furnaces, where the ore comes in contact also with the charcoal which produces the melting heat. To obtain some exact figures of the amount of phosphorus that can be transferred from the charcoal to the pig iron in blast furnaces, I have made some phosphorus determinations, not only of general samples of blast-furnace burdens, taken at six of those furnaces I visited in 1879, but also in the pig iron obtained from those burdens, and, finally, in the pig-iron "reguli," obtained from the same compositions by the crucible assay, the latter to confirm the results from the analyses of the burdens. The results of these investigations will be found in the accompanying table, which also exhibits the amount of charcoal consumed, in parts, of undried charcoal per part (by weight), of pig iron produced, the temperature of the blast, and amounts of pig iron in percentages of the burdens are also given. From these results it will be seen that, generally, as before mentioned, about .01 per cent. of phosphorus in the pig iron may be safely considered as coming from the charcoal. The greater excess in burden E can be accounted for by a greater amount of phosphorus in the charcoal used, which supposition is confirmed by analyses made by Mr. Samstrom, but the cause of it may also be that the general sample of the burden may possibly have been freer from phosphorus than the burden was generally.

Since the following analyses were made I have determined the phosphorus in a pig iron from an iron works in Wermland, which, according to statement, was obtained from ores partly the same as those in E. Analyses of the burden showed only .007 per cent. of phosphorus, but the pig iron contained .027 per cent., which results in almost the same as the one obtained in E.

Blast furnaces situated in:	Burdens are marked:		Temperature of blast in degrees:	Amount of phosphorus found in:
	A	B		
Sweden	117.3	117.3	Undried charcoal charged, parts per 100 parts (by weight) of pig iron produced.	
Sweden	117.3	117.3	Centigrade.	
Sweden	117.3	117.3	Fahrenheit.	
Sweden	117.3	117.3	Pig iron in per cent. of burden as obtained in the blast furnace.	
Sweden	117.3	117.3	Burdens.—Per cent.	
Sweden	117.3	117.3	Pig iron "reguli," obtained by crucible assay.—Per cent.	
Sweden	117.3	117.3	Pig iron produced in blast furnaces.—Per cent.	
Sweden	117.3	117.3	Amount of phosphorus in pig iron calculated from the amount of phosphorus and percentage of iron in the burdens.—Per cent.	
Sweden	117.3	117.3	Amount of phosphorus in pig iron originating from the charcoal.—Per cent.	
Sweden	117.3	117.3	Calculated percentage of phosphorus in undried charcoal.	

Annual Loss by "Spontaneous Combustion" Fires.—Statistics recently published by a contemporary give interesting information in regard to the annual loss in the United States by "spontaneous combustion" fires. The whole number of noteworthy fires of this sort last year was 208, the property loss \$3,115,168 and the insurance loss \$1,864,202. The greatest number of these fires occurred in the warmer months, showing that the chemical changes producing spontaneous ignition are greatly assisted by high temperatures. Eighty-five happened in the summer, against 46 in the spring, 44 in the autumn and 38 in winter. July and August led the other months of the year in number of such fires. In States having the most manufacturing establishments the losses were most numerous and heavy. A schedule giving in detail the classes of property damaged or consumed showed that in barns, granaries and stables, carriage and wagon factories and wheelwright shops, drug and chemical stores, dwellings and tenements, furniture and upholstery factories, junk stores, painters', glaziers' and paper hangers' stores, printing and publishing establishments and vessels at wharves, the most outbreaks from spontaneous combustion occur. No attempt has previously been made to ascertain the yearly losses from this cause, and if the present statistics are trustworthy the surprising fact is revealed that nearly 5 per cent. of the annual number of fires, and more than 3 per cent. of the annual national fire loss, are to be attributed to spontaneous combustion.

Australian Timber.—A board appointed to inquire into and experiment on the best kind of timber grown in the Australian colonies, and adapted for the construction of railway vehicles, says *Engineering*, has sent in its report. Among the woods which the commissioners mention as suitable are blackwood, mountain ash, bluegum and Gippaland mahogany. Under test the blackwood presented results which were superior to any other timber. The mountain ash was second to the blackwood for railway purposes. It should be felled, the commissioners think, during the winter months, when it had attained maturity, and is between 4 and 5 feet in diameter, and it might remain felled for six months before being broken down into planks for seasoning. Bluegum should be treated in the same manner. Going somewhat beyond its reference, the board deals with the question of timber licenses, and recommends that getters be compelled to pay for the timber felled and to confine their operations to a given area, or otherwise that selected lots of trees be sold by tender. It is also strongly recommended that a forest board should be called into existence.

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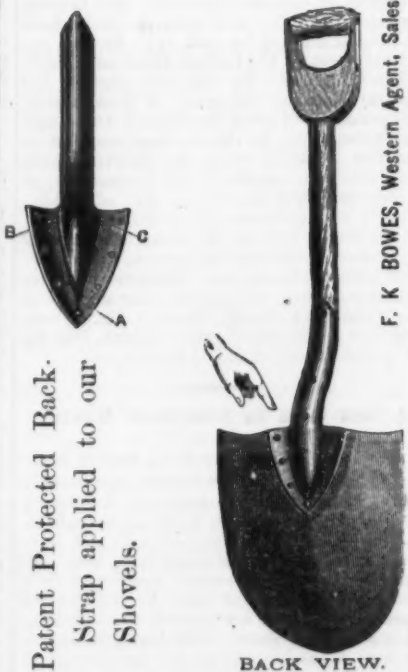
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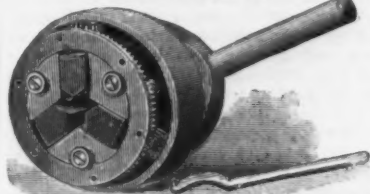
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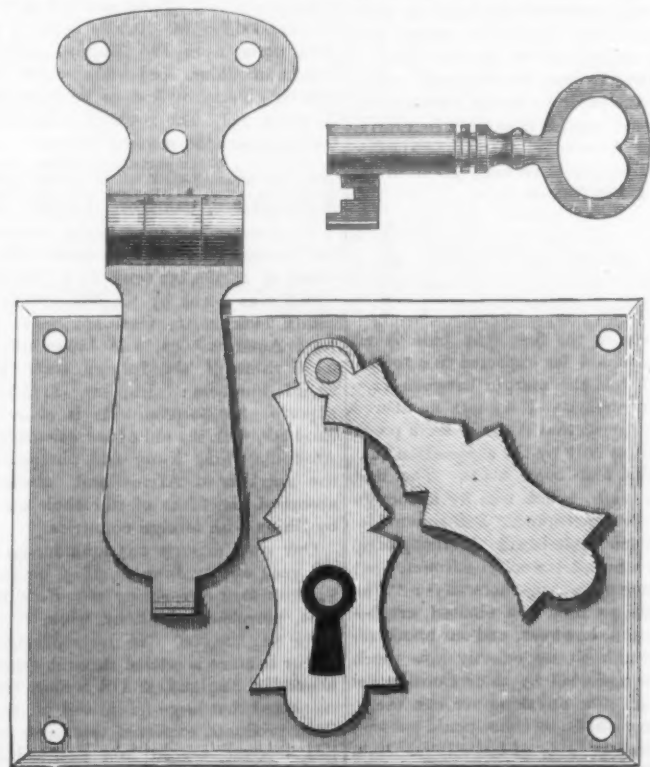
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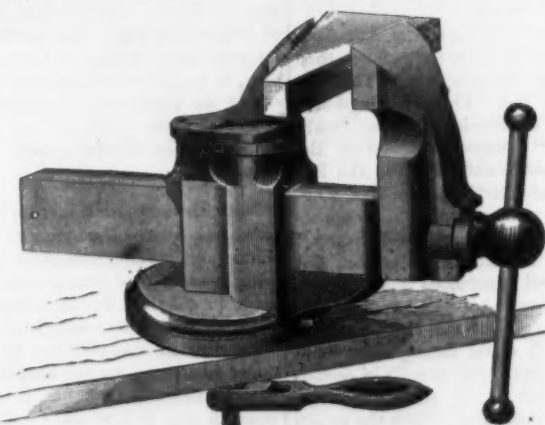
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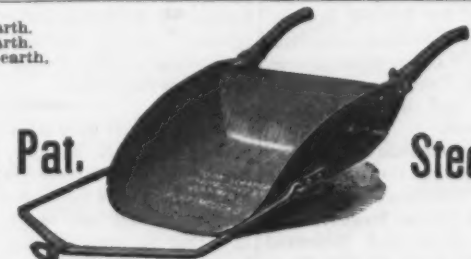
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Cheney Anvil & Vise Co., Detroit, Mich.	47
Fisher & Norris, Trenton, N. J.	47
Apple Parers.	
Penn Edw. Works, Reading, Pa.	44
Arms and Ammunition.	
Alford & Berkele Co., 77 Chambers, N. Y.	29
Hutchinson J. W., 81 Chambers, N. Y.	29
Shovering, Daly & Gales, 84 and 86 Cham.	29
Smith & Co., Rockford, Ill.	41
Stevens J. & Co., Chicopee Falls, Mass.	30
Artisan Well Supplies.	
Lovejoy John F., 102 Chambers, N. Y.	30
Asbestos.	
The Asbestos Packing Co., Boston, Mass.	14
Chalmers-Spence Co., 419 8th, N. Y.	11
Asbestos Paints.	
H. W. Johns Mfg. Co., 57 Maiden Lane, N. Y.	11
Augers and Bits.	
Jennings C. & Co., 94 Chambers, N. Y.	29
Tenniss & Wilson, 234 Broadway, N. Y.	14
Axles, Springs, &c., Manufacturers of.	
Cook R. & Sons, Winsted, Conn.	13
Gautier Steel Dept. of Cambria Iron Co.	34-40
Johnston, N. Y., 100 Chambers, N. Y.	30
Lidgett Spring & Axle Co., Pittsburgh.	48
Wurster F. W., Brooklyn, N. Y.	48
Axes.	
Maun W. Jr. & Co., Lewistown, Pa.	2
Peck A. G. & Co., Cohoes, N. Y.	18
Band Saws.	
McGoy & Sanders, 26 Warren, N. Y.	42
Bankers.	
P. W. Gaudaudet & Co., 2 Wall, N. Y.	9
Bar Iron.	
Virginia Nail and Iron Works Co., Lynch.	14
Barb Wire and Fencing.	
Halsh J. & Co., Decatur, Ill.	41
Cleveland Wire Fence Co., Burlington.	41
Iron Wire Fence Co., Chicago, Ill.	41
Thorn Wire Fence Co., Chicago, Ill.	41
Washburn & Moen Mfg. Co., Worcester.	2
Bellows, Manufacturers of.	
Bullock T. H., Cleveland, O.	40
Flanagan Wm. C., Pittsburgh, Pa.	40
Scott Geo. M., Chicago, Ill.	40
Belt Fasteners.	
Hubbard, Taylor & Co., Northville, N. Y.	41
Bells (Sleigh).	
Bevin Bros. Mfg. Co., Easthampton.	30
Chapman Mfg. Co., Meriden, Conn.	30
Belting, Makers of.	
Alexander Bros., 412 N. 3d, Philadelphia.	30
Main Belting Co., Philadelphia, Pa.	30
N. Y. Belting & Packing Co., 13 and 15 Park.	30
Row, N. Y.	40
Page Belting Co., Concord, N. H.	40
Belt Oil.	
Post E. L. & Co., 10 Peck Slip, N. Y.	29
Bicycles.	
Pope Mfg. Co., 597 Washington, Boston.	48
Bird Cages, Makers of.	
Jewett, John C. & Sons, Buffalo, N. Y.	29
Lindeman O. & Co., 254 Pearl, N. Y.	3
Maxwell John, 247 and 249, N. Y.	14
Pierce Geo. N. & Co., Buffalo, N. Y.	14
Bit Braces.	
Amidon & White, Buffalo, N. Y.	18
Ives W. A. & Co., New Haven, Conn.	38
Black Tackles, Makers of.	
Bagnall & Loud, Boston, Mass.	47
Cleveland Block Co., Cleveland, O.	47
Detroit Block Works, Detroit, Mich.	7
Lovejoy J. F., 102 Chambers, N. Y.	30
McGoy & Sanders, 26 Warren, N. Y.	42
McMillan Wm. H., 113 South, N. Y.	32
Penfield Block Co., Lockport, N. Y.	14
Blowers, Forge and Pressure.	
Huyett & Smith Mfg. Co., Detroit, Mich.	34
Boiler Compound.	
Crecent Mfg. Co., Cleveland, O.	14
Boiler Feeders.	
The Miller Co., Canton, O.	40
Boilers, Steam.	
Babcock & Wilcox Co., 30 Cortlandt, N. Y.	12
Edge Moor Iron Co., 79 Liberty, N. Y.	12
Harrison Boiler Works, Philadelphia.	40
Boiler Plates.	
Wm. McIlvain & Sons, Reading, Pa.	45
The Seidel & Hastings Co., Wilmington.	30
Bolt and Rivet Clippers.	
Chambers, Brother & Co., Philadelphia.	4
Bolt Cutters.	
Howard Iron Works, Buffalo, N. Y.	45
Sellers Wm. & Co., Philadelphia, and 79	45
Wiley & Russell Mfg. Co., Greenfield, Mass.	37
Boring Implements.	
Ives, W. A. & Co., New Haven, Conn.	38
Boxes for Hardware.	
Green & H., New York, N. Y.	30
Brass, Manufacturers of.	
Alameda Brass & Copper Co., 10 Cliff.	24-29
Bridgeport Brass & Copper Co., N. Y.	2
Brown & Bros., 81 Chambers, N. Y.	2
David John & Sons, 100 John, N. Y.	2
Holmes, Booth & Haydens, 55 Park Place.	2
Plum & Alwood Mfg. Co., 18 Murray.	2
Rome Iron Works, Rome, N. Y.	2
Seaville Mfg. Co., 421 Broome, N. Y.	2
Waterbury Brass Co., 240 E. W. N. Y.	2
Brass Butt Hinges.	
Tietout W. S. & Co., 15 Chambers, N. Y.	30
Brass Founders.	
McFarland Wm., Trenton, N. J.	40
Reeves Paul S., Philadelphia.	48
Reynolds Marlin, Brooklyn, E. D., N. Y.	30
Brass Goods.	
Waterbury Mfg. Co., Waterbury, Conn.	2
Bridge Builders.	
Mosley Iron Bridge & Roof Co., 5 Day.	30
Union Bridge Co., 59 Wall, N. Y.	30
Brushes.	
Brownell Brush & Wire Goods Co., Cin.	4
Buckets, Pump and Elevator.	
Iron Cast Mfg. Co., 22 Cliff, N. Y.	48
Builders' Hardware.	
Clark Mfg. Co., Buffalo, N. Y.	38
Nimick & Brittan Mfg. Co., Pittsburgh.	38
Butcher and Shoe Knives, Manufact.	
Wilson John, Sheffield, England.	10
Butts and Hinges.	
Smith & Egge Mfg. Co., Bridgeport.	13
Stanley Works, New Britain, Conn.	34
Union Mfg. Co., 96 Chambers, N. Y.	7
Car Axles.	
Roberts A. & P. Co., 205 S. 4th, Phila.	5
Carriage Bolts, Makers of.	
Townsend, H. & Co., Philadelphia.	40
Carriage Hardware, Makers of.	
E. D. Clapp Mfg. Co., Auburn, N. Y.	40
Eberhard Mfg. Co., Cleveland, O.	40
Smith H. D. & Co., Plainville, Conn.	13
Woodruff, Miller & Co., Mount Carmel.	10
Upson Nut Co., 90 Chambers, N. Y.	10
Car Wheels.	
Union Foundry & Pullman Car Wheel	34
Works, Chicago, Ill.	34
Casters.	
Phoenix Caster Co., Indianapolis.	35
Castings, Iron.	
S. Cheney & Sons, Manlius, N. Y.	30
Devitt Thos. & Co., Philadelphia, Pa.	7
Haight & Clark, Albany, N. Y.	34
Hammer & Co., Bradford, Conn.	39
North Brothers, Philadelphia, Pa.	15
Syracuse Mfg. Iron Wks., Syracuse, N. Y.	4
Tatum Saml. C. & Co., Cincinnati, O.	30
Castings, Steel.	
Chester Steel Castings Co., 407 Liberty.	48
Eureka Cast Steel & Iron Co., N. Y.	48
Flag Stanley G. & Co., Philadelphia.	48
Johnson T. G. & Co., Spuyten Duyvil, N. Y.	48
Kendall, H. & Co., Philadelphia, Pa.	48
Pittsburgh Steel Casting Co., Pittsburgh.	48
Standard Steel Casting Co., Thurlow, Pa.	48

Chains.	
Bradley & Co., 816 Richmond St., Phila.	5
Wm. H. Haskell Co., Pawtucket, R. I.	40
Lovejoy J. F., 102 Chambers, N. Y.	30
Cheese Saws.	
National Wire & Iron Co., Detroit.	3
Chemicals.	
Haines B., Philadelphia.	5
Cherry Stoppers.	
Kimer & Amend, 205 Third av., N. Y.	41
Chisels, Manufacturers of.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Chucks.	
Buck Bros., Millbury, Mass.	13
Clacks.	
Ives W. A. & Co., New Haven, Conn.	38
Smith & Egge Mfg. Co., Bridgeport, Conn.	18
Speeding Mfg. Co., Cleveland, O.	38
Trump Bros. Mach. Co., Wilmington.	38
Clock Springs, &c.	
Dunbar Bros., Bristol, Conn.	7
Clothes Dryers.	
Hill Dryer Co., Worcester, Mass.	10
Coal Hods.	
Esterbrook Wm., Philadelphia, Pa.	34
Coal, Miners of.	
Pardee A. & Co., 111 Broadway, N. Y.	40
Coal Vases.	
Jewett John C. & Sons, Buffalo, N. Y.	29
Coffee and Spice Mills.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Coke.	
Schoonmaker J. M., Pittsburgh.	35
Colters.	
Geo. K. Oyer Mfg. Co., St. Louis, Mo.	42
Compasses & Calipers, Manufacturers.	
Bemis & Call Hardware & Tool Co.	30
Springfield, Mass., 133 Chambers, N. Y.	13
Stevens J. & Co., Chicopee Falls, Mass.	30
Copper.	
Brown & Bros., 81 Chambers, N. Y.	2
New Haven Copper Co., 200 Pearl, N. Y.	2
Pope, Cole & Co., Baltimore, Md.	2
Coppy Presses.	
Ohl Geo. A. & Co., Newark, N. J.	47
Tatum Saml. C. & Co., Cincinnati, O.	39
Cordage.	
Elizabethport Steam Cordage Co., 48	30
South, N. Y.	30
Corn Huskers.	
Graham John H., 113 Chambers, N. Y.	8
Cornier Iron.	
Quincy Floor Plate and Staple Mfg. Co.	30
Quincy, Ill.	30
Corrugated Boiler Furnaces.	
Hartmann, Le Doux & Maeker.	42
Corrugated Iron.	
Cincinnati Corrugating Co., Cincinnati.	42
Knealy & Miller, Chicago, Ill.	42
R. H. Ramsey Mfg. Co., 100 Chambers, N. Y.	4
Coverings, Boiler and Pipe.	
Chalmers-Spence Co., 419 Eighth, N. Y.	11
Cresting Iron.	
Bolles J. E. & Co., Detroit, Mich.	3
Crucibles.	
Seidel R. R., Philadelphia, Pa.	43
Cupolas.	
Collins Furnace Co., Detroit, Mich.	39
Smith & Egge Mfg. Co., Bridgeport, Conn.	18
Cutlery, Importers of.	
Alford & Berkele Co., 77 Chambers, N. Y.	29
Baker Hermann & Co., 101 Duane, N. Y.	30
Butcher W. & S., Sheffield, England.	10
Curley J. & Bro., 134 and 136 Nassau, N. Y.	10
Cutlery, Manufacturers of.	
Bannister A. F. & Co., Newark, N. J.	10
John Russell Cutlery Co., Turner Falls.	48
Norfield Knife Co., Northfield, Conn.	36
Vought & Williams, 288 Greenwich, N. Y.	4
Dinner Pail and Lantern.	
Haight Joseph, Port Chester, N. Y.	8
Dog Collars.	
Pope & Stevens, 114 Chambers, N. Y.	34
Door Checks and Springs.	
Shaw Door Check & Spring Co., Boston.	38
Door Hangers, House and Barn.	
Crook Hanger Co., Elmira, N. Y.	39
Lane Bros., Fourchepine, N. Y.	39
Lovejoy John F., 102 Chambers, N. Y.	30
More S. H. & E. Y., Chicago, Ill.	30
Penn Hardware Works, Reading, Pa.	45
Seneca Mfg. Co., Seneca Falls, N. Y.	43
Wilber J. D., Chicago, Ill.	41
Drilling Machines, Makers of.	
Peelless Punch & Shear Co., 38 W. Day.	37
Wiley & Russell Mfg. Co., Greenfield, Mass.	37
Drop Forgings.	
Brown R. H. & Co., Westville, Conn.	46
Merrill Bros., 26 First st., Brooklyn, E. D.	13
William H. & Bros., West Philadelphia.	45
Williams J. H. & Co., Brooklyn, N. Y.	45
Eaves Trough Hanger.	
Heartley Geo. W., Toledo, O.	30
Edge Tools, Makers of.	
Doscher M. S., Chambers, N. Y.	45
White L. & J., Buffalo, N. Y.	38
Egg Beaters.	
Brown John, 81 Murray, N. Y.	14
Elevators, Makers of.	
Cleaver & More, Philadelphia, Pa.	47
Otis Bros. & Co., 94 Liberty, N. Y.	47
Stokes & Parrish, Philadelphia.	46
Emery.	
Walpole Emery Mills, South Walpole.	36
Engines, Gas.	
Clerk Gas Engine Co., Philadelphia, Pa.	47
Schleicher, Schumm & Co., Phila.	47
Engines, Steam, Makers of.	
Bliss, E. W., Brooklyn, N. Y.	46
Cooke & Co., 22 Cortlandt, N. Y.	44
Runsey L. Mfg. Co., St. Louis, Mo.	44
Southway Foundry & Mach. Co., Phila.	47
The Cummer & Bros. Co., New York.	44
N. Y. Safety Steam Power Co., 30 Cort.	47
Landt, N. Y.	47
The Forwards Iron Works Co., Chicago.	44
The Pusey & Jones Co., Wilmington.	46
The Westinghouse Machine Co.	48
Wetherill Robt. & Co., Chester, Pa.	47
Engravers, Wood.	
Stillman & Co., Cincinnati, O.	41
Expanding Mandrels.	
Geo. H. Oyer Mfg. Co., St. Louis, Mo.	42
Expositions.	
Cooke & Co., 22 Cortlandt, N. Y.	9
Facings, Foundry.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Overmayer S. & Co., Cincinnati, O.	18
Paxson J. W. & Co., 514 Beech, Phila.	5
Farmers' Tools.	
Heller & Bros., Newark, N. J.	45
Facets, Makers of.	
McNab & Harlin Mfg. Co., 30 Gold, N. Y.	45
Feeding and Creasing.	
Enterprise Mfg. Co. of Pa., Phila. & N. Y.	42
Feed Water Purifiers.	
Hall & Sons, Buffalo, N. Y.	7
Fences, Wrought Iron.	
Mass. Fenc. Co., Springfield, O.	36
National Wire and Iron Co., Detroit.	3
Fencing and Creasing.	
Union Mfg. Co., 96 Chambers, N. Y.	7
Fires, Importers of.	
Clay & Riley, 30 Gold, N. Y.	40
Montgomery & Co., 105 Fulton, N. Y.	39
Rice, F. W. & Bro., Woodbridge, N. Y.	45
Files, Manufacturers of.	
Barrett G. & H., 41 & 43 Richmond, Phila.	48
Everhart J. M., Scranton, Pa.	48
Bond, Philadelphia, Pa.	48
McCaffrey & Bro., 1732 & 1734 N. 4th, Phila.	8
Nicholson File Co., Providence, R. I.	8
Paul Chas. B., Williamsburg, Eng.	15
Union File Co., Baltimore, Md.	8
Fire Brick, Makers of.	
Byrner & O'Brien, Philadelphia, Pa.	38
Gardner James, Pittsburgh, Pa.	38
Kreischer & Sons, foot & Houston, N. Y.	38
McLeod H. S., Troy, N. Y.	38
McLeod H. S., Troy, N. Y.	38
Overlander James & Son, Troy, N. Y.	38
Union Mining Co., Philadelphia, Pa.	38
Watson Fire Brick Co., Perth Amboy.	38
Woodbridge Clay Mining & Refining Co.	38
Forges, Portable, &c.	
Bullock T. H., Cleveland, O.	14
Bullock T. H., Cleveland, O.	14
Edwards & Co., 311 Broadway, N. Y.	44
Holt Mfg. Co., Cleveland, O.	44

Founders.	
Bannan, Fras. B. Potsville, Pa.	0
Iron Ore.	
J. W. Pullman, Philadelphia, Pa.	5
Iron Pipe, Importers of.	
Abbott Jere & Co. (Swedish), New York	
& Boston, 100 Chambers, N. Y.	40
Brier Hill Iron & Coal Co., Youngstown, O.	40
Hubbard Chas., 46 Cliff, N. Y.	3
Parry John & Sons, Boston, Mass.	41
Williamson James & Co., 90 Wall, N. Y.	3
Iron Planers.	
Brettel Geo. E., Rochester, N. Y.	47
Iron Sheet, Manufacturers of.	
Everson, Brown & Co., Pittsburgh, Pa.	4
Jersey City Galvanizing Co., Jersey City, N. J.	4
Lefferts, Marshall & Co., 90 Beekman, N. Y.	4
Parry John & Sons, Boston, Mass.	41
Wood W. D. & Co., Limited, Pittsburgh,	4
Iron, Steel and Nails.	
Morris, Wheeler & Co., 14 Cliff, N. Y.	5
Key Blanks.	
Eagle Lock Co., 98 Chambers, N. Y.	38
Rock G. W., Philadelphia, Pa.	30
Key-Way Cutters.	
Morton Mfg. Co., Romeo, Mich.	11
Lanterns, Tubular.	
Forbes and Mfg. Co., Rochester, N. Y.	30
Myers Manufacturing Co., Chicago, Ill.	35
Lathes, Pulley Blocks, Drills.	
Harrington, E. & Son, Philadelphia,	47
Ohl Geo. A. & Co., East Newark, N. J.	47
Lawn Mowers.	
Chadborne & Caldwell Mfg. Co., New-	
burg, N. Y.	38
Lemon Squeezers.	
Ripley Mfg. Co., Unionville, Conn.	39
Leveling Instruments.	
Comstock Wm. T. & Astor Place, N. Y.	9
Locks and Knobs, Manufacturers of.	
Durrie & McCarty, 97 Chambers, N. Y.	26
Eagle Lock Co., 98 Chambers, N. Y.	38
Miller Lock Co., Philadelphia, Pa.	11
Parry John & Sons, Boston, Mass.	41
Nimick & Brittain Mfg. Co., Pittsburgh,	39
Payson Mfg. Co., Chicago, Ill.	39
Parry John & Sons, Boston, Mass.	41
Romer & Co., Newark, N. J.	39
Smith & Egge Mfg. Co., Bridgeport,	38
Stoddard Lock and Mfg. Co., 104 Reade,	38
Taylor Mfg. Co., New Britain, Conn.	32
The Charles Parker Co., Meriden,	11
Wetherill Robert & Co., Stamford,	37
Laborators.	
Barthel A. E., 111 Liberty, N. Y.	45
Lubricator Cups.	
Detroit Lubricator Co., Detroit, Mich.	46
Machinery.	
Badger J. J., 49 Day, N. Y.	29
Barnes W. F. & John, Rockford, Ill.	34
Bliss E. W., 167 Plymouth, Brooklyn,	46
Garrett E. & Co., 139 Center, N. Y.	39
L. M. Rumsey Mfg. Co., St. Louis, Mo.	44
National Machinery Co., Tiffin, O.	44
Peoples Punch & Shear Co., 38 W. Dev,	39
Pittsburgh Mfg. Co., Pittsburgh, Pa.	45
Robinson & Co., Worcester, Mass.	45
Sellers Wm. & Co., Philadelphia, and 76	
Liberty, N. Y.	
Stokes & Parrish, Philadelphia, Pa.	40
Sweeney J. P. & Co., St. Louis, Mo.	43
Stow Flexible Shaft Co., Ltd., Phila.	37
Union Foundry & Machine Works, 28	
The Stiles & Parker Press Co., Middle-	
town, Conn.	48
Works, Chicago, Ill.	34
Wetherill Robert & Co., Chester, Pa.	37
Machinists' Tools and Supplies.	
Belcher W. H., 89 Chambers, N. Y.	4
Madison P. Co., Worcester, Mass.	45
Brettel Geo. E., Rochester, N. Y.	47
King J. M. & Co., Watford, N. Y.	8
Sellers Wm. & Co., Philadelphia, and	
Liberty, N. Y.	
Mallets.	
N. Y. Handle & Mallet Works, 456 E.	
Houston	13
Stokes & Parrish, Rockport, N. Y.	14
Measuring Tapes.	
Eddy Geo. M. & Co., 352 Clason av.,	
Brooklyn	40
Metals.	
Dickerson, Van Dusen & Co., 29 and 31	
Cliff, N. Y.	2
Phelps, Dodge & Co., Cliff, N. Y.	2
Phosphor Bronze Smelting Co., Limited,	
Brooklyn	13
Metallographs.	
Booth, Garrett & Blair, 919 Chant, Phila.	40
Britton J. Blodgett, 330 Walnut, Phila.	40
Mills, Bone Grinding.	
Wilson Bros., Easton, Pa.	11
Mine Lamps.	
Leonard Bros., Scranton,	7
Molding Sand.	
Emerick J. A. & Co., 1056 Beach, Phila.	2
Stokes & Parrish, Philadelphia, Pa.	5
Mouse Traps.	
Adams F. F., Erie, Pa.	29
Lovell Mfg. Co., Erie, Pa.	11
Ripley Mfg. Co., Unionville, Conn.	39
Nails.	
Leatre Nail Works, Bellaire, O.	15
E. & G. Brooke Iron Co., Birdboro,	7
Cumberland Nail & Iron Co., Phila.	3
Fulmer Bros., 125 Greenw., N. Y.	39
Iron Works, Steubenville, O.	34
Oxford Iron Co., 81 Washington, N. Y.	4
Riverside Iron Works, 120 North Delaware	
av., Philadelphia	35
Shoenberger & Co., Pittsburgh,	4
Union Foundry & Machine Works, 28	
burg, Va.	14
Nails, Cut.	
Blankenship R. E., Richmond, Va.	7
Ross W. K., 97 Chambers, N. Y.	4
Nail and Wire Works.	
Leatre Nail Works, Pittsburgh, Pa.	45
Nickel Platers' Supplies.	
The Zucker & Levett Chemical Co., 540	
to 544 West 16th, N. Y.	26
Norway Shingles, Rollers of.	
Naylor & Co., 90 John, N. Y.	40
Rosland William & Harvey, Frankford,	
Philadelphia	48
Nuts, Bolts, &c., Makers of.	
The Allentown Rolling Mills, Allentown,	5
Wm. H. Haskell Co., Pawtucket, R. I.	45
Lovely John F., 102 Chambers, N. Y.	30
Lawman Wm. C., Norwich, Conn.	12
New Haven Nut Co., Westville, Conn.	8
Russell, Burdall & Ward, Fort Chester,	
and N. Y. Chambers, N. Y.	48
Oil Can and Lamp Filler.	
Clark W. J. & Co., Salem, O.	47
Oil Stones.	
Chase Geo., 107th and Harlem River, N. Y.	30
Oil Shoes.	
Millers Falls Co., 74 Chambers, N. Y.	36
Woodruff, Miller & Co., Mt. Carmel,	
Packing.	
Chalmers Spence Co., 419 Elmer, N. Y.	11
N. Y. Belting and Packing Co., 13 and 15	
Park Row, N. Y.	13
Packlocks.	
Eagle Lock Co., 98 Chambers, N. Y.	38
Parry John & Sons, Boston, Mass.	41
Romer & Co., Newark, N. J.	39
Smith & Egge Mfg. Co., Bridgeport,	38
Paint.	
Villings, Taylor & Co., Cleveland, O.	16
Patent Solicitors.	
Briesen F. Y., 82 E. 14th Nassau, N. Y.	3
Stokes & Parrish, Phila. and Washington,	
Stokes & Parrish, Washington, D. C.	10
Parers, Apple and Peach.	
Livington Horse Nail Co., 104 Reade,	
N. Y.	14
Pens.	
Waterbury Steel Pen Co., 29 John, N. Y.	9
Miller Bros., Meriden, Conn.	39
Phosphor Bronze.	
Phosphor Bronze Smelting Co., Limited,	
512 Arch, Philadelphia	13
Picks, Makers of.	
Pierson & Co., 24 Broadway, N. Y.	4
Pipe Iron.	
Belaire Nail Works, Bellaire, O.	15
Lefferts Iron Works, Steubenville, O.	34
Quincy J. W. & Co., 98 William, N. Y.	4
Shenandoah Lumber, Mining	
Philadelphia, Pa.	5
Pipe Cutters.	
Pancoast & Manie, 243 and 245 53d st.,	
Philadelphia	42
Pipes, Fittings, &c., Makers of.	
McNab & Harlin Mfg. Co., 56 John, N. Y.	45
Pipe, Water and Gas, Makers of.	
McNeal A. H., Burlington, N. J.	
Mellert Foundry & Machine Co., Limited,	
Reading, Pa.	1
Reading Iron Works, Philadelphia, Pa.	1
Wood R. D. & Co., 400 Chestnut, Phila.	
Wyckoff A., Elmira, N. Y.	1
Plane Irons, Manufacturers of.	
Planes, Millbury, Mass.	
Planes, Manufacturers of.	
Stanley Rule & Level Co., 29 Chambers,	
N. Y.	2
Planes, Iron.	
Tatum Saml. C. & Co., Cincinnati, O.	39
Plated Ware.	
Afford & Berkele Co., 77 Chambers, N. Y.	2
Hall, Ellis & Co., 47 E. 13th, N. Y.	1
Plumbago.	
Oliver S. & Co., Cincinnati, O.	1
Plumbers' Materials, Manufacturers of.	
Everhart Jas. M., Scranton, Pa.	4
Potato Parers.	
Lowenthal P., Newark, N. J.	45
Power Hammers.	
Beaudry Alex., Boston, Mass.	47
Dienelt & Eisenhardt, Philadelphia, Pa.	40
Presses, Dies, &c.	
Crosby G. & Co., Chicago, Ill.	39
Fornacine Machine Co., Bridgeport, N. J.	10
Presses, Power, Makers of.	
Becher & Peck, New Haven, Conn.	39
Bliss E. W., 167 Plymouth, Brooklyn,	
Merriman A. H., West Meriden, Conn.	40
Parry John & Sons, Boston, Mass.	41
N. Y. Chamber & Shear Co., 38 W. Dev,	
Stiles & Parker Press Co., Middletown,	40
Pressure Regulators.	
Curtis Regulator Co., Boston, Mass.	15
Printers.	
Giles & Co.	
Prints, Books of.	
Clarke Bros., Belmont, N. Y.	10
Douglas W. & B., Middletown, Conn.	3
New England Butt Co., Providence,	42
Sims & Denning Mfg. Co., Salem, O.	3
Pulleys.	
Penn Hardware Works, Reading, Pa.	10
Stearns E. C. & Co., Syracuse, N. Y.	48
Rails, Iron and Steel.	
Allentown Rolling Mills, Allentown,	5
Cambria Iron Co., Johnstown, Pa.	2
Central Rolling Mills, Cleveland, O.	36
Janssen, Hershelm & Co., 10 Exchange	
Place, N. Y.	3
Marshall & Sons, 200 Broadway, N. Y.	40
Pittsburgh Bessemer Steel Co., Pitts-	
burgh	40
Parry John & Sons, Boston, Mass.	41
Railways, Machine & Mining Sup-	
plies.	
Rodgers H. A., 19 John, N. Y.	47
Railway Supplies.	
Fox & Drummond, 68 Wall, N. Y.	4
L. M. Rumsey Mfg. Co., St. Louis, Mo.	44
Sweeney J. P. & Co., St. Louis, Mo.	43
Razors.	
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Refrigerator Fastenings.	
Croissant Chas. & Bro., Albany, N. Y.	43
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Welsh T. F. & Co., Boston, Mass.	15
Rivers.	
Blake & Johnson, Waterbury, Conn.	3
Grundy & Dinsway, 105 Greenw., N. Y.	12
Townsend W. M. & Co., Kingston, Mass.	2
Townsend W. M. & Co., Pittsburgh, Pa.	40
Rock Breakers.	
Blake Crusher Co., New Haven, Conn.	10
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Allen Roofing Co., Cleveland, O.	41
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Rules, Manufacturers of.	
Stanley Rule & Level Co., 29 Chambers,	
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Sad Irons.	
Marshall Mfg. Co., Philadelphia.	
Sap Spouts.	
Post C. C., Burlington, Vt.	13
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Morton Thoms., 65 Elizabeth, N. Y.	42
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Liech Chas. E., 69 Fulton, N. Y.	10
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Farr Aas, 44 College Place, N. Y.	34
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Flagler, Dewy & Thayer, 238 Broad,	
St. Louis, Mo.	43
Tatum Saml. C. & Co., Cincinnati, O.	39
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Selica Mfg. Co., Seneca Falls, N. Y.	43
Scissors, Manufacturers of.	
Buffalo Scissor Co., Buffalo, N. Y.	9
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Scrapers, Road.	
Champion Scraper Co., Troy, N. Y.	39
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Stokes & Parrish, Scraper Co., Sidney, O.	39
York Mfg. Co., Portsmouth, Ohio.	18
Scissors, Makers of.	
Bliss E. W., 17th and Venango Sts.,	
Philadelphia	13
Bruce Ue, W. I. Platt, N. Y.	9
Wm. H. Haskell Co., Pawtucket,	45
Miles F. S., 305 Quaker, Philadelphia.	45
Screw Cutting Machinery.	
Wiley & Russell Mfg. Co., Greenfield,	35
Scythe Stones.	
A. Pike Mfg. Co., Pike Station, N. H.	4
Shading, Makers of.	
Burgess Steel and Iron Works, Ports-	
mouth, Ohio.	9
Crescent Geo. Y., Pa.	47
Peoples Punch & Shear Co., 38 W.	
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Sellers Wm. & Co., Philadelphia, and 76	
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Walker Mfg. Co., Cleveland, O.	40
Shears, Iron.	
Watson & Sullivan, 4708 Grand, N. Y.	47
Shelf Iron Building Materials.	
Portbury A. Co., Pittsburgh, Pa.	42
Self Supporters.	
Quincy Floor Plate and Staple Mfg. Co.,	
Quincy, Ill.	30
Shel Cabinet.	
Creed Geo. H., 103 Reade, N. Y.	10
Shovels, Spades and Scoops.	
Hussey, Blans & Co., Pittsburgh, Pa.	14
Payne Fetterick & Son, Weymouth, Pa.	13
Shutters, Revolving Steel.	
Clark, Bunnett & Co., 103 & 104 W. 97th,	
N. Y.	39
Silica Molds.	
Steel Casting Co., Cleveland, O.	0
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Douglas W. & B., Middletown, Conn.	3
Kilbourne & Jacobs Mfg. Co., Columbus,	48
Skates, Ice.	
Liberty Skates & Kendall, Boston, Mass.	10
Lowenthal P., Newark, N. J.	45
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Champion Roller Skate and Wagon Co.,	
Albany, N. Y.	32
Dame, Stoddard & Kendall, Boston, Mass.	10
Henley M. C., Richmond, Ind.	41
Richards, 100 E. 14th, N. Y.	41
Nantasket Roller Skate Co., Lowell, Mass.	44
Pope & Stevens, 114 Chambers, N. Y.	45
Stokes & Parrish, 29 Chambers, N. Y.	40
Smelting Works.	
Martin Reynolds, Brooklyn, N. Y.	36
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Speaking Tubes.	
Wheeler W. H. & Co., 21 & 23 Ann, N. Y.	12
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Manning & Squier, 113 Liberty, N. Y.	42
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Spooled Wires.	
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Tuck Mfg. Co., Brockton, Mass.	34
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Stokes & Parrish, 29 Chambers, N. Y.	7
Staples.	
Florence Tack Co., Florence, Mass.	40
Steam Hammers, &c., Makers of.	
Dienelt & Eisenhardt, Philadelphia, Pa.	40
Dudgeon Richard, 24 Columbia, N. Y.	9
Steam Pumps, &c., Manufacturers of.	
McGowan John H. & Co., Cincinnati, O.	40
Norwalk Iron Wks. Co., No. Norwalk,	40

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Spelter and Zinc.—Common Domestic Spelter has once more become excessively dull at \$4.60, nominally. Silesian we quote, 1½% @ 4½%. Bertha Refined is worth 8¢. **Sheet Zinc** is a little easier at \$5.70 @ \$5.75. London cables this morning, Silesian £14. 7/6, while our telegram in the afternoon quotes Ordinary, at shipping ports, £14 @ £14. 5/.

Antimony.—Has been moderately active at 10½% *Halvett*, and 10½% *Coak-on*. *Halvett* per cask is quoted £42 in London.

Trade Report.

Philadelphia.

Office of The Iron Age, 220 South Fourth St.,
Philadelphia, August 26, 1884.

Pig Iron.—The market has been rather more active during the past week, and prices are probably a shade steadier. Along the entire line there seems to be more inquiry and more interest in the market, but sales have not been materially larger than during several weeks immediately preceding. The indications point to a heavier business, notwithstanding, as consumers are all running close on their stocks, and must therefore buy from time to time, according to their requirements. In point of fact, it begins to look as though the demand would show some little improvement during the next six or eight weeks, although not to an extent likely to affect prices. The declining tendency seems to have been checked already, but beyond that there is no reason to anticipate further change for the present, at all events. The belief that prices have touched bottom is becoming more widespread, however, and it would be no surprise to many if there should be a slight upward movement later on in the season. Meanwhile, there has been nothing beyond the usual routine demand for small lots, and it remains to be seen whether consumers will abandon the conservative attitude which has served them so well during the past 12 or 18 months. A steady buying movement among consumers for a few days would doubtless have a marked influence upon values, but that can hardly be expected, unless there is a decided improvement in general business, which, while hoped for, and reasonably probable, is by no means a certainty. The present movement may be a "little spurt," or it may be the forerunner of an active fall trade—time only can tell which. Prices are not materially different from what they were a week ago, although the extreme figures are still rather wide apart. No. 1 Foundry varies from \$18.50 to \$21, delivered at tide, with \$19.50 @ \$20 as the ordinary rates for good average qualities. Higher and lower figures, which are not infrequent, depend upon quality and character of brand. No. 2 Foundry is dull and freely offered at prices ranging from \$17.50 to \$19, with the majority of sales of good brands at from \$18 to \$18.50. Mill Irons are also in large supply, medium grades particularly, at from \$16.50 to \$17, while \$17.50 to \$18 is asked for the best brands of Gray Forge. Sellers are disposed to encourage business, however, and when large lots are likely to be taken prices are shaded accordingly, but, on the whole, the feeling seems to be more encouraging than for some time.

Foreign Iron.—There is very little doing at present, and prices are almost nominal. Sellers are anxious for firm offers and are asking \$19 @ \$19.50 for Bessemer, \$20 @ \$21 for special brands, \$27.50 for 20% Spiegel-eisen, and \$23 @ \$23.50 for 10% to 12%.

Blooms.—The market is a trifle more active, although prices vary according to quality. Best qualities are held at firm prices; other descriptions can be had at concessions of \$2 or \$3 per ton from quoted rates, which are about as follows: Charcoal Blooms at \$53 @ \$55; Run-out Anthracite, \$43 @ \$45; Scrap Blooms, \$40 @ \$42; Northern Ore Blooms, \$38 @ \$40.

Muck Bars.—There is a fair movement in small lots, usually at \$29.50 @ \$30 at mill, but there are sellers at less money for some qualities.

Bar Iron.—The demand is not satisfactory to manufacturers, although in one way or another a pretty fair business is done. It is unprofitable, however, both as regards price and character of orders, which are small and spasmodic. Some days there is quite a rush, then follows a pause, so that manufacturers are in a chronic condition of uncertainty—one week busy, another week dull, with nothing tangible to build upon. Unfortunately, there are no indications of any material change in the near future, so that prices are likely to remain as at present, say 1.9¢ for Best Refined Bars and 1.7¢ @ 1.8¢ for Common and Medium, with some slight reduction when the order is desirable as to size and specification.

Plate and Tank Iron.—Without any orders of importance during the week, the market has been held pretty steady at about last week's figures. The demand is for small lots, but sales have been about equal to the week's output, so that there is no change of feature worth noting. Inquiries seem to indicate a continuance of the present condition of things, with prices as follows, subject to some little allowance on large lots, viz.: Plate Iron, 2.1¢; Tank, 2.15¢; Shell, 2.75¢; Flange, 3.75¢; Fire-Box, 4.25¢.

Structural Iron.—Business shows very little change from what it was a week ago. Manufacturers have so little work on hand that they are constantly on the alert for new business, and what little comes in is only about sufficient to keep them moving. There are exceptions, of course, but the average demand is not more than from one-half to two-thirds of the capacity for production, so that competition is close and prices cut to the lowest figures possible.

Sheet Iron.—The demand for Heavy Sheets is pretty well maintained, but other

descriptions are dull and somewhat irregular. Large lots can be had at the usual concessions, small lots as follows:

Best Refined, Nos. 26, 27 and 28.....	4 1/2¢
Best Refined, Nos. 18 to 25.....	3 1/2¢
Common, 1/4¢ less than the above.....	
Best Bloom Sheets, Nos. 26 to 28.....	6 1/2¢
Best Bloom Sheets, Nos. 22 to 25.....	6 1/2¢
Best Bloom Sheets, Nos. 16 to 21.....	5 1/2¢
Common Red Plates, 3-16 to 12.....	2 1/2¢
Blue Annealed.....	2 1/2¢
Best Bloom, Galvanized, discount.....	30%
Second quality, discount.....	50%
Common, discount.....	57 1/2%

Wrought-Iron Pipe.—There is some increase in the number of small orders booked from day to day, but no very general improvement. The market is so bare of large orders and competition so sharp for even small lots that prices are weakened and the combination discounts practically ignored. Nominally, however, the following prices rule: Butt-Welded Black Pipe, 30%; Butt-Welded Galvanized, 20%; Lap-Welded Black, 50%; Galvanized, 35%; Boiler Tubes, 47 1/2%.

Steel Rails.—A considerable amount of business has been entered during the past week, probably 30,000 tons all told, chiefly by manufacturers in Eastern Pennsylvania. Report says that \$26 was accepted for large lots, but it is difficult to find out what the actual figures were. There are sellers at \$27 to-day, and, while lower figures may have been accepted, manufacturers who may be supposed to be well posted on the subject say that they have no personal knowledge of anything as low as \$26. A good many inquiries are being made from day to day, and it is thought that large orders will be entered in course of a few days. Meantime, \$27 @ \$28 is asked, according to quantity, delivery, &c.

Crop Ends.—Prices are weak and sellers anxious for business, at about \$20.50 for shipments of English or German, and \$19.50 for Welsh, with a possibility of still lower prices on firm offers for 500 to 1000 ton lots. American Crops are nominally \$20 at mill.

Old Rails.—There has been rather more activity during the past week, and lots afloat, nearly due, have sold at \$17.50 @ \$18 for T's. Spot lots would probably bring higher prices, as there is more demand and nothing available at less than \$19 @ \$19.50. The market is very uncertain, nevertheless, and, while the tone is decidedly strong to-day, two or three lots of a few hundred tons each might cause a quick reaction in the opposite direction.

Scrap Iron.—There is not much doing, and prices are barely steady at about the following prices asked: Cargo lots No. 1, \$19 @ \$19.50; No. 1 Selected, \$20 @ \$21, and Machinery Scrap at \$15 @ \$15.50; Cast Turnings at \$9.50 @ \$10, and Wrought Turnings at \$15 @ \$16.

Nails.—The demand is fair for the season but prices continue weak and irregular. This state of affairs is due principally to new mills seeking trade at low prices, which makers of established reputation do not feel inclined to meet. There is some talk of closing the mills rather than sell Nails lower, unless there is a reduction in raw material, but the disposition in the trade is to hold out and do the best they can under the circumstances; meantime prices range from \$2.20 to \$2.35, with occasional offerings by new concerns at \$2.15.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue,
Pittsburgh, Pa., August 26, 1884.

There has been no important change in the general Iron situation during the past week; both mill owners and furnacemen, almost without an exception, continue to report business as dull and unsatisfactory. While the demand continues unusually light for the season, the chief cause of complaint is in regard to prices, which under the most favorable circumstances afford little or no margin for profit. Cost of production has been reduced to about the lowest possible limit, and as soon as this is more generally understood and buyers become satisfied that prices have reached bottom, there will, without doubt, be an increased trade. There is no abatement in the putting down of natural gas wells, and the indications are that our manufacturers generally will be using it both as light and fuel before another year goes around. The number of natural gas companies is steadily increasing, and as it is not the intention to let any one company have a monopoly, but as far as possible to place all on an equal footing, consumers will have the advantage of an active competition. Advices from the West and South in regard to business, say that while there, as here, it is dull, hopes are entertained of an early change for the better.

The Coal Valley Coal Company, it is probable, will get the three years' extension asked for. They propose to pay 15¢ in nine months and regularly every three months thereafter until it is all paid. Liabilities estimated at about \$300,000. The Dunbar Coke Company have made an assignment. The Coal and Coke trade is feeling the depression like all other interests.

Iron Ore.—This branch of trade continues very dull, and the outlook is not favorable for any immediate improvement. No. 1 Specular and Magnetic (Bessemer) Ores are still quoted at \$5.50 @ \$6.50 per ton on dock at Cleveland; No. 1 Specular (non-Bessemer), \$5 @ \$5.50. Freight from Cleveland to Pittsburgh, \$1.50 per ton.

Pig Iron.—The most and about the only new feature to note is an increased disposition on the part of consumers to buy and less

disposition on the part of producers to sell. It is evident that the former have begun to be impressed with an apprehension that hard pan has been reached and a reaction possible; and the latter, for the same reason, are less anxious about selling. Consumers are still able to buy in a regular way at ruling prices, but so far as we can learn very few, if any, of the furnaces are willing to contract for future delivery at prices now obtainable. One of the strongest points in favor of the producer is the materially reduced production, and, while there are a number of furnaces ready to blow in on short notice, it is not likely that they will do so in the present condition of affairs, but, on the contrary, some of those now in blast are expected to blow out shortly. A couple of important sales were reported during the week—1500 tons Standard Neutral Forge, at \$16.00, cash, and 1500 do., at \$16.50, 60 days. No. 2 Mill Irons are to be had at \$15 @ \$15.50, cash. Quotations may be fairly given as follows:

Neutral Mill Iron.....	\$16.00 @ \$16.50, 4 mos.
Alt-Ore Mill.....	17.50 @ 18.50, 4 "
White and Mottled.....	15.00 @ 15.50, 4 "
Foundry Irons.....	17.50 @ 19.00, 4 "
Cold-Blast, Charcoal.....	25.00 @ 28.00, 4 "
Bessemer Iron.....	18.00 @ 19.00, 4 "

Muck Bar.—There have been no sales reported during the past week, in the absence of which we continue to quote at \$29 @ \$30, cash, at mill.

Manufactured Iron.—Some manufacturers report an increased demand, while others, and these are in the majority, complain of continued dullness, and all agree that prices are unremunerative, the latter being the most serious cause of complaint. The best makes are still quoted on a basis of 1.65¢ @ 1.75¢ rate for Bars, but poorer qualities are being sold on a considerably lower basis. Skelp Iron is being sold at from 1.75¢ @ 1.8¢. Some of the mills have been working almost exclusively on Skelp all the year, and but for it they would have had little or nothing to do. But few, if any, of the mills are running full. The most of them are working single turn; some, including the Vesuvius and Keystone, are standing idle.

Nails.—Some of our manufacturers report an increased demand, and the indications are that there will be at least a fair degree of activity from now until December. It appears to be generally believed that the market is down to rock bottom, and, with light stocks in the hands of jobbers, manufacturers are of the opinion that they will be able to hold the market well in hand from now on until the advent of the winter season. We continue to quote at \$2.10, 60 days, 2¢ for car lots and upward, and 5¢ @ 10¢ per keg additional in a jobbing way.

Wrought Iron Pipe.—There appears to be an increasing demand, but since the collapse of the combination competition is active, and the cutting of rates is now the rule. Prices have further declined, and we now quote discounts as follows: On Black Butt-Welded Pipe, 40%; Galvanized do., 35%; on Black Lap-Welded Pipe, 60%; on Galvanized do., 45%; 2-Inch or Well Tubing, 13¢ per foot, net; 5 1/2-Inch or Well Casing, 45¢ per foot, net.

Steel.—There is but little that is new to note in connection with this important interest—demand only fair; prices unchanged. Best brands of Refined Cast Steel, 9 1/4¢ @ 10¢; Crucible Machinery, 5¢ @ 5 1/2¢; Open-Hearth and Bessemer do., 2 1/2¢ @ 3¢. We can report a sale of Steel Nail Slabs at \$32 per ton; this latter is for making Steel Nails.

Steel Rails.—So far as we can learn there have been no sales made in this market below \$28, cash, at mill, for heavy sections.

Old Rails.—The last sales of Old Iron Rails reported were at \$20.50, which appears to be the ruling price. Mixed lots of Steel Rails are quoted at \$17 @ \$18, and good, even lots at \$19 @ \$20.

Crop Ends.—A re still quoted at \$18 @ \$18.50 per ton for American.

Railway Track Supplies.—Continue dull, and it is intimated that desirable orders can be placed below the rates quoted: Spikes, 2.35¢, 30 days; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2 1/2¢ @ 2 3/4¢.

Scrap.—Trade continues light and prices weak, but unchanged. No. 1 Wrought Scrap, \$19 @ \$20, net ton; Old Car Axles, \$27 @ \$28; Wrought Turnings, \$15 @ \$16; Cast Borings, \$12 @ \$12.50, gross ton; Old Car Wheels, \$16.50 @ \$17, gross ton.

Window Glass.—Continues very dull for the season, but an increased demand is looked for soon. No change in prices. Discount on Double Strength in carload lots, 70 and 5%; on Single Strength, 60 and 10%.

Coke.—A slight improvement in demand is reported, but business is far from being satisfactory. About 55% of the ovens, both in and outside of the syndicate, are running. Blast Furnace Coke is still quoted by the syndicate at \$1.10 per ton on cars at ovens.

Chicago.

Office of The Iron Age, 35 and 38 Clark St.,
Cor. Lake St., Chicago, Aug. 25, 1884.

Hardware.—During the past week there has been a little improvement over the previous one. Mail orders are increasing in number and quantity ordered. Buyers are more frequently seen on the street, and business in the large jobbing houses is assuming a more active appearance. Among goods to be shipped can be found Measures, Scoop Shovels, Manure Forks, Axes, Picks, Anvils

and a general assortment of Heavy Hardware. Trade in Axes is not heavy, though inquiries are growing. In Blacksmiths' Tools there is a fair trade, that promises to be much better in the near future. There is nothing of importance to note in prices. Some few changes have occurred in the manufacturers' lists, which have been mentioned elsewhere in our columns, all of which were of a downward nature. The market is in a very fair condition, and present demand all that can be expected for the season.

Barb Wire.—There is no change to note in Barb Wire. Stocks are in good supply and demand light. There is no movement on the part of manufacturers, so far as heard from, to start up their factories or to make a combination price. The market is greatly demoralized on all points, and in no particular does it show any feature of improvement. Painted is quoted at 4 1/4¢ and Galvanized at 5 1/4¢, carload lots. In a jobbing way 1/2¢ additional is asked.

Nails.—An increasing demand is reported in the Nail market. The weakness in price, however, confines the majority of sales to small lots, which usually can be had at nearly the same price as larger quantities. Carload buyers are not satisfied that present prices are bottom, and always look for additional concessions. During the week \$2.25 was the ruling figure on car lots, but sales have been reported at \$2.20, and less on some inferior stocks which had been disposed of in job lots. From store, in a small way, \$2.30 is asked. Steel Nails are sold at about 15¢ per keg advance on the price of Iron Nails. Makers of Steel Nails are confident that they will be able to place their Nails on the market at as low figures as the best Iron Nails are sold before the fall season closes. An opinion prevails that, should the Steel Nail be sold at the same figure as the Iron Nail, the former will largely supersede the latter and make it almost unsalable. Dealers object to it now on the ground that they do not wish to carry two stocks.

American Pig Iron.—The flurry of a week ago has passed off almost as suddenly as it came. The market for the past week was one of weakness and uncertainty, but no further reduction in prices has been noted. The fall in Southern Iron did not result in any increased demand, and, as stated by a prominent house, would not if the price were cut to \$10 or \$11 per ton. The only advantage that can be achieved from further reduction in price will be in favor of speculation. Consumers are not buying beyond what they need and cannot be induced to take risks on the market until they feel that there will be a demand for their manufactured articles. The market, nevertheless, has suffered greatly from the shaking up of a week ago, and is in rather a demoralized condition. Nearly every furnaceman has set his own prices, and when these cannot be obtained he must "blow out" or pile up his iron. The stringency of the money market and the several sharp lessons that banks have had on iron collateral make it difficult to secure an advance, so there remains but one alternative, to "blow out." To this end everything seems to be moving, and observing consumers are cognizant of the fact. The probability of no iron makes contracting a necessity, and for the week the demand was fairly active, consumers taking such brands as could be obtained at their respective bids. The Jackson Iron Company have again withdrawn from the market and instructed their agents that they positively will not accept less than \$21 per ton, Chicago.

There are other Charcoal Irons that can be had at from 50¢ to \$1 per ton less, some of similar quality, while others are inferior. In placing their contracts, consumers at times show preference for furnaces that will be able to fill the contract under all conditions, and it is not infrequent that they pay 25¢ per ton more for some special brand. For immediate delivery and carload buying the lowest man has the advantage in sales, and books the largest tonnage but shortest profits. Disregarding the circumstantial cause that produced lower figures last week, the following prices are quoted by the trade as bottom for carload lots, four months: Lake Superior Charcoal, Nos. 1, 2 and 3, at \$21 @ \$21.50; Nos. 4, 5, and 6 at \$22; Lake Superior Coke at \$20; Lake Superior and Ohio, mixed, at \$20 @ \$21; Ohio Standard Black Band, No. 1, \$21; Southern, No. 1, at \$18; No. 2 at \$16.50; Silvery Soft at \$17.50 @ \$19.50; Anthracite, No. 1, at \$21, and No. 2 at \$20; Bessemer Pig, \$18.75.

Scotch Pig.—The market for Scotch Iron has been more lively this week. Buyers have been more liberal in their orders and the demand stronger than for several weeks. We quote as follows: Summerlee, \$25.50, cash, from yard, and \$24.50 to arrive; Glengarnock, \$25.50 from yard, and \$24 to arrive.

Merchant Steel.—A better feeling is reported for the week and some improvement in the demand for the best grades, while the lower grades have been in fair request by the implement-makers. One concern have been asking bids on 3,500,000 lb, which is only part of their order, and others are in the market for less quantities. It is said that the season promises well from the various sources of consumption for trade, but prices show no improvement. Nothing can be learned here that changes the position of Syndicate Steel, which is still quoted at 7¢ @ 7 1/2¢, the tendency being in the Plow-makers' favor. For the Best Refined grades

from store we make the following quotations:

	Per pound.
Best Refined Cast Yool Steel.....	9 @ 10¢
Crucible Cast Machinery Steel.....	6 1/4 @ 6 1/2¢
Open-Hearth Machinery Steel.....	5 1/4 @ 5 1/2¢
Bessemer Machinery Steel.....	5 @ 5 1/4¢
Open-Hearth Spring Steel.....	5 1/4 @ 5 1/2¢
Toe-Calk Steel.....	5 1/4 @ 5 1/2¢
Bessemer Steel.....	5 @ 5 1/4¢
Fire-Box and Boiler Steel.....	5 @ 5 1/4¢

Steel Rails.—This market seems to be out of line on Steel Rails. All efforts fail to develop anything that will give an approximate position of the makers. Inquiries are not on the surface, and to those not in the business it looks as though there was no demand at all. However this may be, mills are unwilling to name a price for future trade, and assert that the prevailing prices would not be acceptable for present delivery. In circles outside it is strongly hinted that one or two of the mills in this vicinity will shut down when present contracts are exhausted rather than take contracts at from \$27 to \$30, which about covers what could, in all probability, be obtained at present for such orders as are afloat.

Old Rails.—The market for Old Rails is very quiet. No sales are reported for the week, and prices remain at \$17 @ \$18 so far as transactions rule. Higher figures are asked by holders, but mills are unwilling to meet their requests. Old Steel Rails are marketless at about \$15.

Structural Iron.—New contracts for Structural Iron have fallen off very much during the last 10 days. The greatest annoyance is experienced by some of the mills in satisfying those for whom they are making Shapes, &c. The season is fast advancing, and all are hurrying to get their buildings under cover before bad weather sets in. In some cases makers are behind in their work, and in others the contractor is in advance of specified time. From store trade is fairly good yet, but lighter than several weeks ago. We continue the following quotations, with 1/4¢ @ 1/2¢ added for delivery from stock: Beams, \$3.60; Channels, \$3.60; T Iron, \$3; Angle Iron, \$2.50; Flitch Plates, \$2.50; Frieze Plates, \$2.70.

Bar Iron.—The week past has been an improvement over the previous one in demand for New Puddled Iron. Buyers of carload lots are asking estimates for future delivery as well as present, and placing orders with more freedom. No change in price has occurred, and, as the dullest season of the year is now rapidly passing away, there is every indication that the lowest point has been touched. New Puddled Refined Iron is quoted at \$1.90 @ \$2. Common Iron has been in better request, though nothing favors a very brisk trade. Price at mill is quoted at \$1.60 @ \$1.70, and from store at \$1.80 rates.

Norway Bars.—Somewhat of a revival has been experienced in the Norway Bar trade in the past 10 days. Messrs. Jones & Laughlins, who have just received 300 tons, have reduced the price to \$3.75 to merchant trade, as per their late classification. To consumers the price is at 4¢ rates, same as before. The promising condition of their trade has induced them to place another order for 100 tons more, to be delivered about the 1st of October.

Galvanized Iron.—The market for Galvanized Iron is about the same as a week ago. Cornice interests are the source of most of the trade, with a more liberal demand from makers of Stamped Wares. There is nothing in sight that can greatly improve the trade. We make the following quotations: Juniata, 52 1/2¢ off; Charcoal, 55¢ off, and Refined, 57 1/2¢ off.

Black Sheets.—The unsatisfactory prices for Black Sheets in this market make the business very undesirable to the jobber. The snarl among dealers reduced prices to such a low figure that there is no money in the trade and no iron to be had at the figures that they can afford to pay. Their stocks are low and the demand growing every day. Several attempts have been made to "arrange" the business, but matters have not materially changed. The market is reported as firmer, without changing the price. Makers of Light Sheets are firm in their demands, and the jobber is in a quandary how to buy No. 27 Iron at \$3 and sell it at \$2.80 @ \$2.90 and make a "fair profit." We quote as follows from store: Nos. 10 to 14 at \$2.60 @ \$2.70; No. 24 at \$3; Nos. 25 and 26 at \$3.10, and No. 27 at \$3.20 from store.

Old Wheels.—Market weak and stock more than can be taken by consumers. Foundries are quoting \$17, in small lots.

Scrap Iron.—The abundance of Old Iron in the market keeps prices down and weak. Mills continue to quote \$15.50 @ \$16 for No. 1, and \$11 @ \$12 for No. 2, Chicago or Milwaukee delivery. We make the following quotations as dealers' purchasing prices: No. 1 Wrought Scrap, per net ton, \$15; Cast Scrap, per net ton, \$12; No. 1 Stove Plate Scrap, per net ton, \$8; Wrought Turnings, per ton, \$8; Cast-Iron Borings, \$6; Old Plow Steel, \$9; Tool Steel, per ton, \$15; Locomotive Steel Tire, per net ton, \$13; Buggy Springs, per net ton, \$14.50; Malleable Scrap, \$5.

EVERETT & POST, 156-Lake street, Chicago, report to us as follows, under date of August 25, 1884: **Pig Lead.**—There has been no material change in Pig Lead during the past week. Prices are nominally \$3.40 and \$3.37 1/2. The demand is principally for Refined Lead, though very limited. The recent reported sales in New York at \$3.55 have had a tendency to demoralize buyers to a certain extent, though there is a general impression that said

sales were made to depress prices to \$3.50 to enable speculators to buy in at that price. The visible supply of Lead is not large, and even a moderate fall demand would soon exhaust stocks. We think present prices low and very safe to buy at ahead of requirements.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts., Chattanooga, August 25, 1884.

There is no perceptible change in commercial and productive circles in the South. Considerable complaints are made of slow collections, yet very few dealers are regarded as shaky. The low price of grain, 70¢ @ 80¢ for wheat at the wharves or delivered on cars, makes receipts very light. The trade in builders' materials has somewhat improved, and if the present demand continues an advance, especially in lumber prices, may be expected. This has been the duller August the South has experienced for years. Business usually picks up somewhat at this season, but the month, on the whole, has been rather a duller one than July. The weather has been intensely warm during the entire week and very dry—the first "heated term" of the summer.

Pig Iron.—There is nothing new to report in the movement of Pig Iron. Several of our furnaces are getting rid of their products without loss. It transpires that the firm producing more iron than any other in Tennessee has just made a contract for a yearly supply of ore, and others seem quite determined to keep going, though all would probably bank in, provided it were a general movement. We note sales of Coke Foundry, in 1000-ton lots, at \$16; Hot-Blast Charcoal to foundry and machine shops, \$18 cash at furnace. We quote small lots, 60 days: No. 1 Foundry, \$17 @ \$18; No. 2 Foundry, \$16.50; Gray Forge, \$14 @ \$15; White and Mottled, \$13 @ \$14; Car-Wheel Metal, \$22 @ \$24.

Ores.—We quote Fossiliferous Ores, averaging about 50% Metallic Iron, \$1.50 @ ton, delivered at river landings; higher qualities, \$2. Brown Hematite, \$2 @ \$2.25 on cars at furnace.

Miscellaneous Articles.—Old Rails, \$16; Wrought Scrap, \$11 @ \$14; Old Wheels, \$16; Cotton Tie Clippings, \$10. Buyers and holders are apart on this list and the articles are nominal.

Merchant Iron.—Bar is slow at \$1.70 for big bills; Spikes, \$2.25; Bolts, \$2.50 @ \$2.75; Splices, \$1.70.

Barb Wire.—Cambria Link and Four-Point, Galvanized, 6¢ @ 7¢ lb.

Coal.—We quote Fancy Lump at \$3; Common Lump, \$2; Egg, \$2.25, delivered. Run of mine to manufacturers, \$1.50 at mills. A pool has been formed by the Coal operators of Kentucky, Tennessee, Georgia and Alabama, to foster mutual interests, regulate prices, secure better rates of freight, &c.

Coke.—We quote at \$2 @ \$2.25 at furnace; Foundry Coke at 8¢ @ 10¢ @ bushel.

Cincinnati.

AUGUST 25, 1884.—**Pig Iron.**—During the past week some of the late quotations to consumers have resulted in sales of considerable lots, in several cases orders being booked for supply through the year at full prices. Some of the furnaces in this region that were reported to be in favor of "banking up" for a given period have ceased to get in Ore and are blowing out, not to resume until better prices prevail. Stocks at the furnaces in Western Pennsylvania, Northeastern Ohio and the Hanging Rock region are perceptibly decreasing, while the demand for consumption is well kept up. It is argued that the production of Virginia, Tennessee and Alabama will be able to supply any deficiency in the production of the Western furnaces, but this remains to be verified. What the action of the Southern furnaces will be has not yet been developed. It is only known that they are, like the rest, sadly in need of remunerative prices. Quotations of sales in the past week:

HOT-BLAST CHARCOAL FOUNDRY.	
Hanging Rock, No. 1.....	\$21.00; No. 2, \$20.00
Alabama and Tennessee, No. 1.....	20.00; No. 2, 19.00
Lake Superior, No. 1.....	22.00; No. 2, 22.00
COKE FOUNDRY.	
Hanging Rock, No. 1.....	19.00; No. 2, 17.50
Pennsylvania and Eastern Ohio, No. 1.....	19.50; No. 2, 19.00
Virginia, Tennessee and Alabama.....	17.50 @ 18.50
STONECOAL FOUNDRY.	
Hanging Rock American Scotch, No. 1.....	18.75; No. 2, 17.25
Hanging Rock Silver-Gray Scotchmen, No. 1.....	\$18.75; No. 2, \$17.25
Others.....	15.50 @ 17.50
CAR-WHEEL.	
Hanging Rock Cold-blast Charcoal, Warm.....	27.00 @ 29.00
Southern.....	23.00 @ 25.50
Lake Superior.....	23.00 @ 24.00
FOUR-POINT.	
Stonescoal, Coke and Charcoal.....	15.00 @ 20.00

St. Louis.

HOFFER & Co., Pig Iron and Iron Ore merchants, 318 Olive street, report to us as follows, under date of August 25, 1884: There is very little change to report in the condition of the Iron market here. Some business is doing, but not enough to warrant any change in prices. We therefore continue quotations of last week:

HOT-BLAST CHARCOAL FOUNDRY.	
Missouri.....	\$19.00 @ 20.00
Southern.....	20.00 @ 22.00
Ohio.....	24.00 @ 25.00
COAL AND COKE IRONS.	
Missouri.....	19.00 @ 20.00
Southern.....	18.50 @ 19.50
Ohio.....	21.00 @ 22.50

MILL IRONS.	
Red-short.....	17.00 @ 17.50
Neutral.....	16.00 @ 17.00
CAR WHEEL AND MALLEABLE IRONS.	
Missouri.....	19.00 @ 20.00
Southern.....	25.00 @ 26.00
Ohio.....	23.00 @ 22.00

Louisville.

GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of August 25, 1884: The market during the last week has shown more activity than for some time past, and several orders for round lots have been placed, though prices remain as they were:

PIG IRON.	
Southern Coke, No. 1, Foundry.....	\$17.50 @ \$18.00
No. 2.....	16.00 @ 16.50
Hanging Rock Coke, No. 1, Foundry.....	18.00 @ 18.50
No. 2.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1, Foundry.....	22.00 @ 23.00
Southern Charcoal, No. 1, Foundry.....	18.00 @ 19.00
Silver Gray, different grades.....	15.00 @ 15.50
Southern Coke, No. 1 Mill, Neutral.....	14.00 @ 14.50
No. 2.....	13.50 @ 14.00
Southern Charcoal, No. 1 Mill.....	16.50 @ 17.00
White and Mottled, different grades.....	13.00 @ 14.00
Southern Car-Wheel, standard brands.....	25.50 @ 26.00
Southern Car-Wheel, other brands.....	20.00 @ 24.00
Hanging Rock, Cold-blast.....	26.00 @ 27.00
Warm-blast.....	21.00 @ 21.50

Baltimore.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports to us the following, under date of Aug. 25, 1884: Trade for the past week has somewhat improved. There were more inquiries made, and some good orders were taken at tolerably fair figures. The excessive warm weather had the tendency to increase the sale of Horse Shoes, and it is now with considerable difficulty that a stock of leading sizes can be kept on hand. Prices are about the same as last reported:

Ref. Bar Iron, 1 to 6 x 1/4 to 1, 10 to 12 @ 2 @ 3 @ 4 @ 5 @ 6 @ 7 @ 8 @ 9 @ 10 @ 11 @ 12 @ 13 @ 14 @ 15 @ 16 @ 17 @ 18 @ 19 @ 20 @ 21 @ 22 @ 23 @ 24 @ 25 @ 26 @ 27 @ 28 @ 29 @ 30 @ 31 @ 32 @ 33 @ 34 @ 35 @ 36 @ 37 @ 38 @ 39 @ 40 @ 41 @ 42 @ 43 @ 44 @ 45 @ 46 @ 47 @ 48 @ 49 @ 50 @ 51 @ 52 @ 53 @ 54 @ 55 @ 56 @ 57 @ 58 @ 59 @ 60 @ 61 @ 62 @ 63 @ 64 @ 65 @ 66 @ 67 @ 68 @ 69 @ 70 @ 71 @ 72 @ 73 @ 74 @ 75 @ 76 @ 77 @ 78 @ 79 @ 80 @ 81 @ 82 @ 83 @ 84 @ 85 @ 86 @ 87 @ 88 @ 89 @ 90 @ 91 @ 92 @ 93 @ 94 @ 95 @ 96 @ 97 @ 98 @ 99 @ 100 @ 101 @ 102 @ 103 @ 104 @ 105 @ 106 @ 107 @ 108 @ 109 @ 110 @ 111 @ 112 @ 113 @ 114 @ 115 @ 116 @ 117 @ 118 @ 119 @ 120 @ 121 @ 122 @ 123 @ 124 @ 125 @ 126 @ 127 @ 128 @ 129 @ 130 @ 131 @ 132 @ 133 @ 134 @ 135 @ 136 @ 137 @ 138 @ 139 @ 140 @ 141 @ 142 @ 143 @ 144 @ 145 @ 146 @ 147 @ 148 @ 149 @ 150 @ 151 @ 152 @ 153 @ 154 @ 155 @ 156 @ 157 @ 158 @ 159 @ 160 @ 161 @ 162 @ 163 @ 164 @ 165 @ 166 @ 167 @ 168 @ 169 @ 170 @ 171 @ 172 @ 173 @ 174 @ 175 @ 176 @ 177 @ 178 @ 179 @ 180 @ 181 @ 182 @ 183 @ 184 @ 185 @ 186 @ 187 @ 188 @ 189 @ 190 @ 191 @ 192 @ 193 @ 194 @ 195 @ 196 @ 197 @ 198 @ 199 @ 200 @ 201 @ 202 @ 203 @ 204 @ 205 @ 206 @ 207 @ 208 @ 209 @ 210 @ 211 @ 212 @ 213 @ 214 @ 215 @ 216 @ 217 @ 218 @ 219 @ 220 @ 221 @ 222 @ 223 @ 224 @ 225 @ 226 @ 227 @ 228 @ 229 @ 230 @ 231 @ 232 @ 233 @ 234 @ 235 @ 236 @ 237 @ 238 @ 239 @ 240 @ 241 @ 242 @ 243 @ 244 @ 245 @ 246 @ 247 @ 248 @ 249 @ 250 @ 251 @ 252 @ 253 @ 254 @ 255 @ 256 @ 257 @ 258 @ 259 @ 260 @ 261 @ 262 @ 263 @ 264 @ 265 @ 266 @ 267 @ 268 @ 269 @ 270 @ 271 @ 272 @ 273 @ 274 @ 275 @ 276 @ 277 @ 278 @ 279 @ 280 @ 281 @ 282 @ 283 @ 284 @ 285 @ 286 @ 287 @ 288 @ 289 @ 290 @ 291 @ 292 @ 293 @ 294 @ 295 @ 296 @ 297 @ 298 @ 299 @ 300 @ 301 @ 302 @ 303 @ 304 @ 305 @ 306 @ 307 @ 308 @ 309 @ 310 @ 311 @ 312 @ 313 @ 314 @ 315 @ 316 @ 317 @ 318 @ 319 @ 320 @ 321 @ 322 @ 323 @ 324 @ 325 @ 326 @ 327 @ 328 @ 329 @ 330 @ 331 @ 332 @ 333 @ 334 @ 335 @ 336 @ 337 @ 338 @ 339 @ 340 @ 341 @ 342 @ 343 @ 344 @ 345 @ 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R. C. HOFFMAN & Co., Pig and Railroad Iron Merchants, No. 21 South Frederick street, write as follows, under date of August 25, 1884: The Iron market remains much the same as last reported. Orders are for immediate use, with some inquiry for future deliveries. Prices remain unchanged, and we quote about as follows:

Baltimore Charcoal Wheel Iron (all sizes).....	\$25.00 @ 29.00
Virginia Cold-blast Wheel Iron.....	28.00 @ 29.00
Anthracite, No. 1.....	21.00 @ 22.00
No. 2.....	19.00 @ 20.00
Gray, No. 1.....	17.00 @ 18.00
Mottled and White.....	15.00 @ 16.00
Charcoal C. B. Blooms.....	50.00 @ 55.00
Refined do.....	40.00 @ 45.00

Imports and Exports.

IMPORTS.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending August 26, 1884:

Hardware.	
Bamberger & Oppenheimer.....	200 tons
Iron wire, cs., 29.....	200 tons
Baldwin Bros. & Co., Gun barrels and fittings, cs., 29.....	200 tons
Belcher Henry W. Shovels, bales 1.....	200 tons
Baker Hermann & Co., Hdw., cutlery and guns, pkgs., 52.....	200 tons
Dejong Louis & Co., Mch'y, cs., 3.....	200 tons
Dodge, Alfred, Mch'y, cs., 1.....	200 tons
Drexel, Morgan & Co., Guns, cs., 36.....	200 tons
Degrauw, Aymar & Co., Chains, cs., 5.....	200 tons
Field Alfred & Co., Guns, cs., 6.....	200 tons
Folsom H. & D., Arms, cs., 13.....	200 tons
Fraser A. & Co., Case, 1.....	200 tons
Friedrichs Hugo, Chains, cs., 12.....	200 tons
Gridley & Co., Engine work, cs., 9.....	200 tons
Gerdon Otto, Bales, 14.....	200 tons
Graf Cutlery Co., Chains and hardware, cs., 8.....	200 tons
Gt. Western Disp. Co., Pkgs., 6.....	200 tons
Hartley & Co., Mch'y, cs., 2.....	200 tons
Hawley & Co., Guns, cs., 30.....	200 tons
Herot L. D., Boiler, 1.....	200 tons
Jaffray E. S., Gun, 1.....	200 tons
Kuhle E. S., Mch'y, cs., 3.....	200 tons
Merch. Disp. Co., Arms, cs., 49.....	200 tons
Mach'y, case, 1.....	200 tons
Moore's Sons J. P., Guns, cs., 10.....	200 tons
Morrell Bros., Mach'y, pkgs., 9.....	200 tons
Putney Daniel, Gun barrels, cs., 2.....	200 tons
Richard C. B. & Co., Mach'y, cs., 80.....	200 tons
Schoverling, Daly & Co., Arms, cs., 10.....	200 tons
Schulz & Ruckgaber, Arms, cs., 43.....	200 tons
Taylor W. B., Boiler, 1.....	200 tons
Ward Asahel, Case, 1.....	200 tons
Western Transit Co., Cases, 1.....	200 tons
White J. F. & Co., Mach'y, cs., 14.....	200 tons
Wiebusch, Hilger & Co., Hdw. and cutlery, pkgs., 24.....	200 tons
Witte John G. & Bro., Case, 1.....	200 tons
Mach'y, cs., 5.....	200 tons
Machines, cs., 10.....	200 tons
Mach'y, pcs., 50.....	200 tons
Mach'y for Canada, pkgs., 72.....	200 tons
Iron.	
Brockner, Evans & Co., Wire net's, rolls, 100.....	200 tons
Coddington, T. B. & Co., Sheets, bds., 332.....	200 tons

Metals.	
Bache Semon & Co., Tin foil, cs., 5.....	200 tons
Blake Bros. & Co., Plumbago, bbls., 820.....	200 tons
Broker Hermann & Co., Blasting caps, cs., 8.....	200 tons
Bruck & Co., Terne plates, 435.....	200 tons
Brown Bros. & Co., Plumbago, bbls., 65.....	200 tons
Bond, Parsons & Co., Terne plates, bxs., 1072.....	200 tons
Crooks Robert & Co., Tin plates, bxs., 2173.....	200 tons
Zinc sheets, cs., 300.....	200 tons
Coddington, T. B. & Co., Tin plates, bxs., 122.....	200 tons
Cort N. L., Tin plates, bxs., 185.....	200 tons
Carter, Hawley & Co., Tin plates, bxs., 550.....	200 tons
Drexel, Morgan & Co., Tin plates, bxs., 550.....	200 tons
Downing R. F. & Co., Nickel, cs., 6.....	200 tons
Elward J. B. & Co., Old bars, bbl., 1.....	200 tons
Field Alfred & Co., Percuss'n caps, cs., 30.....	200 tons
Gilliland, Wood & Co., Tin, ingots, 885.....	200 tons
The importations of Cutlery, Hardware and Metals for the week ending August 22 were as follows:	
Antimony.....	140
Brass goods.....	54
Bronzes.....	33
Chains and anchors.....	53
Clocks.....	87
Copper.....	6,581
Copper ore.....	4
Cutlery.....	139
Gas fixtures.....	143
Guns.....	11
Iron, pig, tons.....	1,348
Iron, sheet, tons.....	66
Iron, other, tons.....	718
Lead, pigs.....	1,400
Machinery.....	32
Metal goods.....	380
Nails.....	5
Needles.....	19
Old metal.....	1
Plate metal.....	31
Plumbago.....	31
Pins.....	17
Saddlery.....	3,101
Spelter.....	2,393
Steel.....	58,14
Silverware.....	5
Tin, bxs.....	30,813
Tin, 798 slabs.....	1,794,479
Wine.....	14
Zinc.....	27,044
Zinc oxide.....	150

The comparison with previous dates is as follows:

	Quantity.	Value.
Antimony.....	140	8.15
Brass goods.....	54	5.83
Bronzes.....	58	3.35
Clocks.....	69	9.04
Clocks.....	87	9.04
Copper.....	.....	9.58
Copper ore.....	139	.....
Cutlery.....	139	44,725
Gas fixtures.....	2	25
Guns.....	143	25,071
Hardware.....	11	943
Iron, pig, tons.....	1,348	54,165
Iron, sheet, ton.....	66	4,353
Iron, other tons.....	718	39,541
Lead, pigs.....	1,400	2,928
Machinery.....	52	5,74
Metal goods.....	380	80,971
Nails.....	5	610
Needles.....	19	8,354
Old metal.....	19	1,507
Platedware.....	18	2,583
Pumpbagg.....	31	19,489
Saddlery.....	17	2,607
Steel.....	30,813	47,993
Spelter.....	38,1	5,04
Silverware.....	.....	.....
Tin, 7798 slabs.....	30,813	83,540
Tin, 7798 slabs.....	1,794,479	334,138
Wire.....	14	2,738
Zinc.....	37,644	108
Zinc oxide.....	130	1,037

The comparison with previous dates is as follows:			
	For the week.	For the 34 weeks week.	Same week, 1881.
Cutlery, pkgs.....	139	3,899	5,122
Hardware, pkgs.....	11	318	834
Iron, R. R., bars.....	.....	9,422	10,644
Lead, pigs.....	1,400	25,261	6,234
Steel, pkgs.....	30,813	1,249,250	2,372,900
Tin, 7798 slabs.....	30,813	1,274,974	1,342,085
Tin, bxs.....	.....	.....	.....

Trade Report.

General Hardware.

The amount of business done during this month has been below the expectations of the trade, and we hear much complaint on this score. Especially is there a disappointment in the matter of large orders, which are this year very backward. As compared with most other lines of business, however, hardware men have no special cause of complaint, as their condition is better than that of most other trades. The week since our last has been uneventful, and the changes in prices have been few and unimportant.

NAILS.

There is a fair demand for small lots, but orders for carloads are not very frequent. The ordinary trade moves along rather steadily, prices running about as they have been. Efforts to sell in greater quantity, however, result in the naming of lower figures, buyers taking advantage of any disposition on the part of sellers to force the market. The majority of sellers are, consequently, managing their transactions cautiously and endeavoring to adhere as closely as possible to natural conditions. The export trade keeps up pretty well and affords an outlet for a considerable quantity of Nails, which would otherwise press upon the market. Existing low prices are stimulating the movement of Nails abroad, the season having been much better in this respect than the corresponding season of last year. Inquiries for Steel Nails continue, and moderate sales are made, but the difference in price between them and Iron Nails, which is now 25 cents per keg or more, deters parties from ordering as freely as they would if prices were closer together. We continue to quote Iron Nails on a basis of \$2.30 @ \$2.35 for small lots from store in New York City, and \$2.25 for large lots.

BARB WIRE.

While the local trade is not at all brisk, there is a steady influx of small orders, with an occasional call for a carload or more. Very little demand from the West or Southwest is reported as yet, but the South is developing a little better business, and the export trade amounts to something considerable. An occasional order may be placed at a little lower rate than quotations, but sellers are usually endeavoring to secure the full price, insisting that they cannot make concessions without loss, owing to the firmness of the price of Plain Wire. It is reported that there is a very good prospect of the production of Barb Wire being curtailed involuntarily to some extent, the Washburn & Moen Manufacturing Company having applied for injunctions against several of the leading Barb Wire manufacturers, to restrain them from continuing operations until certain matters are decided. The curtailment of output just about the time that the fall trade is expected to commence would evidently stiffen prices. We continue to quote small lots of Galvanized Four-Point at 6 cents per pound and Painted at 5 cents; carload lots of Galvanized, 5½ cents, and Painted, 4½ cents.

We are in receipt of catalogues and price lists showing the extensive line of Farm Machinery, &c., manufactured by the George K. Oyer Manufacturing Company, St. Louis, Mo. Among the pamphlets is the catalogue for 1884-85, illustrating Buggies, Carriages and Spring Wagons made by the Springfield Buggy and Wagon Company, for whom the George K. Oyer Manufacturing Company are sole agents. Another catalogue is devoted to the exhibit of Sugar Cane Machinery, of which an extensive variety is shown. An edition of this list is also printed in Spanish. Among the other goods which are illustrated and described are the Excelsior Feed Mill, Corn Shellers, the Dexter Lock Lever Sulky, Hay Rake and Roll Cutters, Colter Blades and Hubs, to which special attention is directed, and the cut of which is shown on their advertisement on page 42. These manufacturers report trade for the first half of the year as having been satisfactory, but for the present rather light as compared with former years.

The Bindley Hardware Company, Pittsburgh, Pa., have issued, under date of August 1, discount sheet No. 3, applying to their catalogue, Vol. 2. With these they are also sending out supplementary pages to be inserted in their catalogue, exhibiting the variety of goods which they have added to their assortment since the issue of the volume. Among these we may mention Keystone Hollow-Ware, Gem Coat and Hat Hooks, the Ajax Boring Machine, Mathe's Burglar-Proof Sash Locks, Heller's Turning and Farriers' Hammers and Farriers' Pinners, a line of Whips, Roller Skates and miscellaneous goods.

We have received from the Shepard Hardware Company, of Buffalo, N. Y., samples of the "Punch and Judy" and the "Humpty Dumpty" Toy Savings Banks. They are well finished in the striking colors usual in such goods, and are intended to retail at \$1 each. They are both 7½ inches high by 6 inches wide, and are made wholly of iron. They are amusing, and seem to have the elements of popularity.

The illustrated catalogue of Art Metal Work for Furniture Decoration and fine Cabinet Locks, just issued as Catalogue No. 27, by J. B. Shannon & Sons, 1020 Market street, Philadelphia, shows, in addition to those contained in previous catalogues, a

number of new goods lately added to meet the demands of the popular taste which has had so remarkable a development in this direction. While the regular line is sufficient to meet most requirements, the manufacturers are prepared to carry out special designs when furnished, and they make designs for the exclusive use of different furniture manufacturers. Charles E. Little, 59 Fulton street, is agent for these goods. Mr. Little has also secured the general agency for the Shipman Steam Engine, burning kerosene, of one man, 1 and 2 horse power, for running stationary machinery and small steam launches. He will mail circulars on application.

The "Correction Sheet No. 2," of the Francis T. Witte Hardware Company, 111 Chambers street, New York, gives the changes in prices since the publication of their net price list of 1883. They say: "Our quotations are strictly net; all rebates, as well as all trade and cash discounts, have been deducted. We do not sell 'culls' or 'seconds' unless specially so stated."

We print below extracts from a large number of letters received from manufacturers on the subject of cutting by jobbers of manufacturers' prices. While there is practical unanimity in admitting the evil, there is a wide difference of opinion as to its causes, and the proper remedy, if any is suggested. A very large proportion of the writers are persons who are very prominent in the trade and whose names would give great weight to what they say did we feel free to give them. We will give these extracts without further introduction, except that the first is from an extensive Western jobbing house, all the others being from manufacturers in many various lines of staple goods, as well as patented specialties:

The articles on "cutting prices" in yours of the 14th and 21st inst., from the standpoint of the manufacturer, throw the blame wholly on the jobber. We admit our share of the cutting, and our only excuse is competition. As suggestions for a remedy are invited, allow us to say that in our opinion one cause of the excessive competition is delivery by manufacturers to jobbers in distant cities free of freight. This delivery puts jobbers in all the principal cities on a par as to cost; consequently, they become competitors with each other all over the country. Suppose the manufacturer to sell f.o.b. at his railroad station, the freight to distant cities then becomes a protective tariff, and confines the jobber to the territory naturally tributary to his city. In this way competition, being confined to the jobbers of one city among themselves, would be more easily controlled than among jobbers of the whole country. These remarks apply more particularly to heavy goods, in which the most competition exists. We earnestly hope this discussion will result in much good to all concerned, but fear the only real remedy is the old one of experience, and that competition will increase until the ranks are thinned out by failures, and those who are left can then realize a living profit on their business.

It is and has been a conundrum to us ever since we commenced business, and we let the jobbers solve it. We guarantee our prices to them and advertise to the retail trade and consumers to create a demand. We have heard of so many ways of evading "combination" prices, "contracts," "rebates," &c., that we have never attempted to fix a selling price. The duration of a patent and life is too short to try and convince the jobbers that they can get decent prices on goods in which they have no competition from manufacturers.

We have had but very little trouble with jobbers cutting prices, except in one or two instances, and in those cases, as soon as we were assured of the fact, we promptly revised our discounts (to the cutters), so as to effectually put a stop to the practice. Fortunately, we are not wholly dependent upon the jobber for an outlet for our goods, and so could afford to take a stand that other manufacturers not so circumstanced might not deem advisable. While there are a great many jobbers in the Hardware trade that are honorable, square-dealing men, there are many others who seem to think that "a manufacturer has no right that a jobber is bound to respect," and seem bent upon "killing the goose that lays (for them) the golden egg," by forcing the manufacturer to cut loose from them entirely, and make a market for himself among the small dealers or even among the consumers, and it is evident to us that many manufacturers are beginning to see that their independence, if not their success, lies in that direction.

It is a very serious trouble, like others which are a fruitful source of, and cause also, of the fearful demoralization of prices in all kinds of goods. In a dull and declining market salesmen anxious for orders, ambitious to increase their trade, and more particularly new ones, depend more on shading prices than talking up quality or relying on the merits of their goods to secure trade. We know of no remedy for it. Jobbers will sell at whatever price they choose. One extreme follows another, and the intense competition will last until some get tired and lay down, while the survivors will be able to get more remunerative prices.

We think there is a tendency on the part of jobbers to desire to make too much profit on staple Hardware, and that they should be satisfied with about 10 per cent. above cost of goods after paying freight.

The article referred to, however, reflects our views and our experience pretty accurately. In common with other manufacturers we have suffered, are suffering, and suppose we shall continue to suffer, from the insane policy of the jobbers referred to. There are, of course, prudent, conservative men

among this class, but it is difficult for them to stem the tide and prevent the mischief done by their brethren who are so ambitious to be at the bottom of the market, and who, as they phrase it, "will not be undersold." No jobber was ever the first to cut prices, so far as our observation goes. He is always and forever meeting some quotation that never was made. One source of the difficulty is the hot-headed, impulsive drummer, who goes out to sell goods at regular prices if it can be done without too great exertion, but at all hazards to sell goods, and who is always ready to meet prices without taking the trouble first to find out that they were really made. Then, of course, the shrewd country dealer must come in for his share of the blame in reporting quotations that were never made. This is, perhaps, as has been stated by others, the most serious part of the trouble. What gives point and force and momentum to it all is the quaking fear each jobber has that he is going to get left, and that some competitor will get away his customers unless he is very generous with them. If there is anything in the above that has not been suggested a dozen times before, you are welcome to it. It would be more interesting reading, no doubt, if we were able to suggest a remedy. Won't some one of the thousands who are trying to fill the Patent Office with models and drawings of beneficent devices turn his attention for a little while this way? If he could hit the right thing in some happy moment, there would be "millions in it" for him.

The "cutting of prices" is an abomination, and only tends to bring prices to a lower level and continued complaints from jobbers to manufacturers that they cannot make profit enough on their goods, when the blame is all on the part of the jobbers. The manufacturer might furnish his goods to them at less than cost, and the result would still be the same.

Being manufacturers, and presumably, therefore, able to take a fair view from either standpoint, we would say that the difficulty complained of is one of those incidents which accompany a condition of trade like that which confronts us at present. It is only necessary to take a general view of things to become convinced that the matters alluded to are not limited to the Hardware trade, but extend themselves to the whole sphere of commercial activity. Cutting of prices and underselling are only special forms of the general tendency to make concessions in order to realize and keep things going, as the phrase is. The most of business houses feel better when they see activity around them—hands busily employed and goods moving, even when, as is too frequently the case, profits are very questionable. In dullness and apathy there is a sense of depression which it is very hard for active business men to bear. We do not presume here to make any remarks concerning what we may suppose to be the causes of the present condition of things, nor ought we to be considered as defending the disposition to make concessions animadverted upon. The only point we wish to make is that certain conditions of trade have certain invariable accompaniments—bad times have had accompaniments and good times good ones—and these conditions are certain to be reflected in the contemporaneous opinions of interested parties. Trade is like water; when it flows freely the impurities in it are not perceived, for they are carried off by the current; but when it is stagnant the bad elements all come to the surface and stay there, to offend the eye of the beholder.

There very much force in the view that you take in this matter, and it would be a very desirable thing, both to manufacturers and jobbers, if it could be remedied, but we are unable to suggest any remedy. We are of the opinion that any special discount given to jobbers they would feel at liberty to use as they see fit, and would not consent to any restrictions being placed upon them. We wish that we were able to suggest some practicable remedy for the difficulty.

We have received complaints from many quarters justifying all here charged. So far as we are concerned, we shall endeavor to protect our interests by having our salesmen visit the retailers direct. This seems the only recourse left us.

We do not sell our goods to jobbers. We have about 300 agents in all the principal cities and towns of the United States; they buy our goods at regular discounts, according to the business they do for us, and are obliged, under their contract with us, to always sell at the full price and never to give any discounts whatever. We hold our agents strictly to this contract, and if any of them are known to violate it we take the agency from them. We believe it is the best way to do our kind of business, and it works very satisfactory to all concerned. When a purchaser knows that there is but one price, and that no one can buy any less, he is generally satisfied. The agents are generally satisfied, because they are sure of their commission. Our commissions are not large, and they do not need to be, because an agent always gets the full commission and never has to divide with a customer.

Your remarks in *The Iron Age* of 14th concerning the cutting of prices per the jobbers we think very opportune, and something that will bear repetition. As far as we are concerned, the jobbers have made prices for our goods for many years. Manufacturers in our line have (as in every other other business) given those who buy largely a lower price than those who buy in small quantities, and, as far as our experience goes, the jobbers have universally used this extra price to obtain orders—dividing it with their customer, &c.

We have experienced considerable annoyance from the matter alluded to in your issue of the 14th inst., "cutting of prices by jobbers," who secure special discounts on large purchases. Our opinion is that this condition of things is largely due to the fact of the over-anxiety to do business, and the agencies employed to secure same. The

drumming system at the present age is one of the necessities of trade, but so many incompetent persons are employed for this purpose (in many instances simply because they can be employed at small salaries), who are devoid of experience and good judgment, without ability to comprehend the schemes resorted to by shrewd buyers to bear down prices to the very lowest notch, and so credulous that they believe every statement they hear, are easily influenced to overstep their instructions and yield a point or two in their discounts, even at the risk of the displeasure of their employers, who too often spend all their time in their offices or about their works, and never go down into the arena of trade, and are led to believe from the statements of these mushroom salesmen that the necessities of the case demanded the reduction. Our policy has always been never to give the cost of our goods to salesmen, except to old, tried and trusted ones, in whose judgment we have explicit confidence and who we know will not abuse their knowledge. We teach our salesmen it is their business to sell goods at a profit, and their value to us is not measured so much by the amount of goods they sell as by the profit their business yields. The most effectual remedy for this trouble is to radically change the method of many tradesmen who are unable to see that working without profits, less than the expenses of doing business, is suicidal to their interests.

While we deplore the cutting of prices, and with our brother manufacturers suffer greatly from the folly of merchants, we know of no relief for the manufacturer unless it be the extermination of the entire jobbing trade, so-called. Our experience with this class of dealers has led us to look upon them as a piratical crew, living upon the legitimate profits of honest merchants. As a class, they care nothing for the manufacturer's interest, their only desire being to sell, and to accomplish this, and in order to get a small profit on the entire sale, they will sell some particular goods not only at less than manufacturers' prices, but at from 2½ to 5 per cent. less than they themselves pay for the goods. We ourselves do not care to deal with this class of "merchants," and will not give them prices nor sell them goods if we know their manner of doing business. If manufacturers would try to sell their goods direct to the legitimate dealers in the villages and towns, and ignore the jobbing trade, they would secure better prices for their goods, and, in the long run, do their selling with less expense to themselves.

Our experience is that the manufacturers have had more to do with low prices than the cutting of prices by the jobbers, and that there has been an increasing disposition on the part of the manufacturers of placing their goods, at least in our line of manufacture, directly in the hands of the users. By referring to the direct rates we notice discount on certain brands of goods at, say, 25 per cent., and at the same time the manufacturers will retail their goods at 45 and 50 per cent. discount. This has caused our branch of business to be very unsatisfactory. There is only money nowadays in articles that are made under patents and by special machinery.

The cutting of prices by jobbers is a very serious and annoying matter, but how can it be prevented and whose fault is it? While it is true that some over-anxious ones, desiring to show large sales and become known as "king" jobbers, sell goods at and below makers' prices, they are in a measure backed up by manufacturers whom they buy from, and the manufacturer is in a measure the prime cause of all the trouble. The manufacturer establishes his prices and sends out the salesman to solicit orders from the jobbing trade generally; one after another is visited and sold to, in accordance with instructions. In due time Chicago, St. Louis or some other large trade center is reached, where an order of unusual size is presented and captured, but not until an additional discount is made. The jobber's price has been cut by the manufacturer because the order is a large one. The customer may not be so safe a party to sell to, and perhaps during the long run of one or more years may not buy as many goods of this particular manufacturer. But the large order filled the eye of the salesman, and must be secured. So far it would not be very bad if the king jobber would only put this special extra discount in his pocket and keep it; but the example is set and is followed by the jobbers' salesmen for quantities that should pay a liberal margin. The small, or even large, jobber would not object, I am sure, to the special discount given the king jobber, did the k. j. only keep it; but he don't keep it, as we all know, and therefore the trouble. So long as the present state of affairs exists, the only remedy we can see is that of treating a buyer who buys in such quantities as to be generally rated as a jobber, and sells his goods in original packages to the retail dealers, to class him as a jobber, have one price for retailers and one for jobbers, and treat a jobber as a jobber, whether in Buffalo or Toledo, Cincinnati or Columbus, Chicago or Des Moines.

The extent of this evil is determined by the stress of competition between the manufacturers. Excessive competition makes the manufacturer helpless. He dreads losing a good customer, and will not, under such conditions, venture to dictate to the jobber at what price the latter shall sell his goods. The root of all the evils to which you have called attention in your journal is excessive competition. No manufacturer who is not driven to it by competition will allow freights all over the United States, or will sell to syndicate buyers or will let his goods be sold by jobbers at prices lower than he sold to the jobber. No manufacturer will so truckle to the demands of his trade unless he is driven to it by competition. And the only remedy that we can see is for makers of established, recognized brands of goods to combine and make rules not only to determine the selling price of their goods by the manufacturers, but the selling price by the jobber. No one manufacturer can do this successfully unaided; he requires the co-operation of his competitors. The jobbers

will be thankful for such protection. It is not to be presumed that they desire a demoralized condition of things. The jobber only wants to feel assured that the manufacturer or combination of manufacturers who says to him, "Thus far shalt thou go, and no further," is powerful enough to enforce the rule equitably, and he will gladly and eagerly conform to it. Therefore, the only remedy we can suggest is such a union of manufacturers as will enable them to restrain the jobbers from unhealthy competition. We have known of cases where jobbers have asked for this kind of protection against themselves.

There has always been more or less conflict between the prices of makers and jobbers, and I suppose it has recently been intensified by the decreased volume of business offered and continual depreciations of values generally. The remedy for a very embarrassing condition of affairs lies in concerted action, which may restore the market to a more harmonious condition.

In regard to jobbers giving away special discounts, we know of but one remedy for it, and that is for manufacturers to stop giving special discounts, as the merchant has as much right to give away a portion of his profits to get trade as the manufacturer has; but if the merchant sells goods for less than a living profit, let the manufacturer, when he discovers it, stop selling to such merchants, and, when the merchant fails and cannot pay in full, compel him to go out of business, so that honest and honorable merchants can get a living profit.

So long as the manufacturer voluntarily puts it in the power of two or three large jobbers, by the giving of an extra 10 per cent. for quantity orders, to make a leader of his goods and demoralize his trade, he has little to grumble about, and experience works its own cure if he wants it cured.

Our experience is that jobbers undersell our regular trade prices. We have personal knowledge of several cases the past season where jobbers have sold some kinds of our goods at a gross profit to them varying from 5 to 10 per cent. Our experience also is that there are very few jobbers in the country to whom we could make a special price (we mean a price below our usual extreme price) without said jobber underselling the regular market price to the amount of the special we had given. There are, of course, exceptions to this rule, but the rule is that, if we make a special price for any reason that at the time being seems satisfactory to us, we hear within three or four weeks of said special price being "given away" by said jobber. The problem of the day with both manufacturer and jobber is, not how to sell goods, but how to sell them at a reasonable profit. The fact is, undoubtedly, that there are too many jobbers in the country and too many manufacturers, producing over-competition, and it seems to us that at present we are all going through a "survival of the fittest" process, and fair profits will not be obtained until some of us are "thinned out." It is easy to theorize that a jobber ought to get a good profit, but if the representative of a jobbing firm starts out on the road to sell, with his prices all arranged so they will pay his employers a fair profit, and the first customer he calls on (who perhaps has been a valued customer for a great many years) informs him that, while he wants a few goods, he can buy them at considerably less figures than those offered him by said salesman, the question is, of course, What had said salesman better do? Pass the customer altogether or sell some goods at prices that do not pay a profit, and hope to retain said customer until a time comes that he can sell him some goods at a fair margin? We know from experience it is an easy matter for an employer to sit in an office and theorize that a salesman ought to sell goods at good profits. We also know from experience that it is an entirely different thing when a salesman calls on a customer and finds said customer is buying goods at much lower prices than he (the salesman) has been instructed to offer.

As to the injurious effect of the practice of jobbers in the giving away of their special discount, thus cutting prices, and in many cases underselling the manufacturer to smaller dealers and consumers, there can be no doubt. The evil, no doubt, is growing. Our company have had occasion to realize this fact, and expect soon to take up the matter and consider it with a view of determining whether there is any, and if any, what remedy. The subject will be found to widen as it is considered more carefully, and to have difficulties connected with it not easily solved or remedied. We shall await much interest the effect of your very proper criticism in the last *Iron Age*, and what, if any, action it may bring about by manufacturers.

I have read with much interest your article of the 14th in regard to the cutting of prices by the jobbing trade, and with your permission will submit a few ideas on this point: 1. I do not consider the question of the publication of discounts by *The Iron Age* as one which admits of discussion. They must publish these prices or give up any claim as a trade journal. With published prices by nearly every manufacturer in the country, a complaint of such publication in a condensed form by *The Iron Age* is puerile and worthy of no consideration. 2. The jobbers themselves demand these prices in print. Acting on the suggestion of the jobbers, some manufacturers have made an endeavor to discontinue all lists and discounts and make sales at net prices, but it has been found almost impossible to do this on account of the demand of the jobbers themselves. "We must have a guide," they say; "we cannot be bothered with making out net prices." And it follows that if there is a printed list there must be a printed discount, especially as the custom of large lists and heavy discounts has greatly increased of late. 3. With a special price to jobbers there always has been and always will be "cutting" by jobbers, as there never has and never can be any uniformity in this "special." It is by no means confined to



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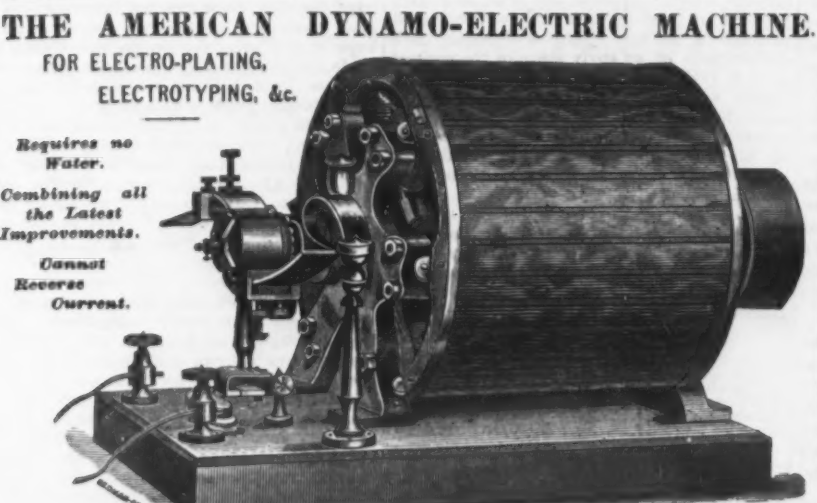
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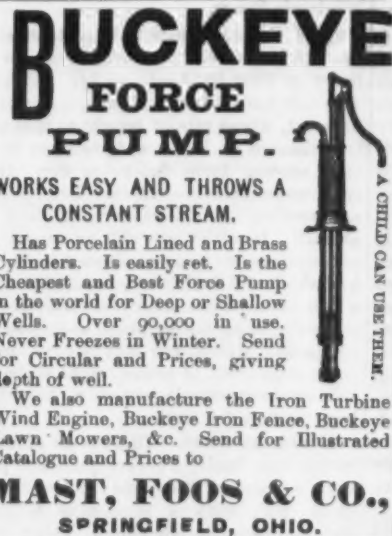
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English Letter.

(From Our Regular Correspondent.)

LONDON, Aug. 11, 1884.
THE WEEK

which has just closed was a very quiet one in almost all respects, the bank holiday on Monday having been considerably elongated in several quarters, while the general autumnal holiday season is now in full force. August is always regarded as being an "off" month, and it is this year certain to be no exception to the rule, even though the harvest is an unusually early one in almost all parts of the country. While touching upon harvest prospects, I may state that during the past week or two days we have had some of the most magnificent weather known in this country for a very long series of years. The sun has shone in a cloudless sky day after day, and the temperature has ranged between 75° and 94° in the shade, with great regularity. All outdoor operations have been carried on, consequently, under the most favorable conditions, and the reaping of wheat, oats, barley, &c., has made exceedingly rapid progress. In all directions the reapers are at work from "early morn to dewy eve," so that another week will see most of the cereals gathered in the south and southeast of England. Further north the reaping may be a little later, but everywhere in these islands the harvest will be specially early, and for the most part particularly good. I am induced to repeat some of these details, because I find in the latest file of American papers to hand mentions of "unfavorable crop reports from Great Britain," on which slender foundation various castles in the air are erected. There should be no mistake hereon; the facts are as I have stated them more than once, and at the worst computation we count upon a distinctly better harvest than for 10 years past. What this may mean to the manufacturing industries cannot yet be ascertained or predicted, simply because the prices of wheat, &c., have not yet been settled on the new basis. That such prices will not be high is clear, seeing that India has a big crop ready for us, the wheat portion of which can be conveyed from Calcutta to London at the very low charge of 10/ per quarter (2 sacks of about 2½ cwt. each) all told. Indian wheat, as you doubtless know, is at present much too hard and often too dirty for general use here, but it is used for mixing with softer sorts, and will in time be so modified by the introduction of European seed as to meet all our requirements. This will be a serious matter for British agriculturalists, but it may be even more so for the farmers of your Western States.

Elsewhere I treat of the iron markets in my usual manner, but since these remarks were penned (and just as I am on the point of closing this letter) reports have come in by telegraph which speak of considerably amended shipbuilding prospects at the Clyde. According to these reports new orders for about 50,000 tons of shipping have just been placed with leading firms thereabouts, and there are other inquiries about for a further 50,000 tons. If these statements be fully corroborated (which I have no reason for doubting) a welcome sustentation will be given to the northern iron and steel trades, and that, too, at a juncture when they most sorely need it. I hear, privately, that the new orders are mostly for iron or steel sailing vessels and that they have been booked at the low figure of £10 per ton. Before my next other details may possibly be forthcoming. In the meantime Mr. Lowthian Bell has caused some little sensation by stating, in the course of a speech delivered at the annual meeting of the Mechanical Engineers, that Raylton Dixon & Co., the well-known northern shipbuilders, have opened a yard in Norway where they can turn out iron vessels with English materials at 15/3 per ton cheaper than in this country. The difference is mainly in the cost of labor, which is a cheap commodity in Continental Europe. I happen to know that several shipyards have recently been started in Norway. One of them, at Bergen, is a promising concern and is being run by an enterprising gentleman who imports all his plates, angles, &c., from the North of England.

THE IRON MARKET

is once more entirely without features worthy of being specially noted. The week has been a good deal broken in a business sense by the bank holiday, and the fine weather is having its usual effect at this season of the year. The seaside resorts and inland spas, &c., are all doing well this year and should reap great advantages from the diversion of visitors caused by the cholera scare on the Continent. This is also a feature favoring the opinion that the home markets may now be expected to make an early movement in the right direction; hence there is a fair ground for hoping and believing that we may soon reach the long-looked-for turning in the lane of depression along which we have been passing. At Glasgow the warrant market opened rather weaker after the short vacation, and prices have been somewhat lower, but close at 41/6 per ton. Shipments of pig iron from the Clyde continue to decline, and compare very unfavorably with those at the corresponding period of last year. Present prices are also low, warrants being as cheap now as they were on the same date in 1879. Stocks are about at a standstill, despite the relatively small output of the furnaces. At Middlesboro', the monthly statistics and other circumstances have had rather adverse effects, and the tone of the market is less firm, with a drop in values, so far as No. 3 is concerned, of about 6d per ton. The local consumption is poor and shipments are below recent totals, so that the "bears" have everything in their favor. Much less Middlesboro' pig iron is going to Scotland. In hematite pig irons there is literally no change to note and no animation in the trade. Quotations are largely nominal at late figures—say, 44/ at 45/6 for mixed lots in usual proportions, with a slow demand and heavy reserve stocks. Other sorts of crude iron are similarly dull in the open market, and deliveries on contracts are mostly lighter than during the first half of the year.

The heavy branches of the iron trade are not active, especially in the shipbuilding de-

partments. Fencing wire and galvanized iron are without changes, but are still dull and disorganized. Ordinary merchant iron is unaltered on the purely nominal basis of £7 10/ for marked bars, with good bars selling at £6 @ £7 and common at £5 7/6 @ £5 15/ per ton. The demand, such as it is, runs largely on the commoner sorts. I call ordinary Welsh, in usual India assortments, £4 17/6 @ £5 per ton. Sheets are in quiet request, as also are hoops, strips and ordinary angles. In old materials there is no variation; the scarcity of old rails does not seem to stimulate the demand. Heavy wrought scrap is not inquired after. Freights are about as of late, pig iron by ordinary steamers, Glasgow to New York, being easy at 3/6 per ton. With respect to the Bristol Channel ports, I am advised as under by Edwardes, Robertson & Co., Cardiff: "We are glad to be able to report that for the month of July our shipments from this channel have very largely increased on the figures for several months past on railway iron, and especially tin plates. This arises in a great measure, no doubt, from the fact that outside tonnage has offered freely and at low rates. This may be accounted for by the increased demand for room and a slight increase in freights on the other side. We quote as a current rate on tin plates, &c., 7/6 @ 8/ per ton to New York, and there is nothing at present to indicate any rise, as vessels are still offering freely. We can record no transaction with the Southern ports, as no demand whatever exists for room. Freights would, however, rule low if there were any shipments to be made."

Mr. W. Balchin, London, reports: "The freight market to most ports has been steady during the past month, goods coming forward in fair proportion to the tonnage placed on the berth. To the Australian and New Zealand ports vessels continue to be dispatched with good cargoes at fair rates of freight, with the exception of Adelaide, to which port shipments have been very scarce and small in quantity. Some slight advance in rates to Melbourne may now be looked for by sail, most of the season's clippers being on their way out, and chartered tonnage supplying the present demand. To Sydney rates remain much the same, with the exception of some slight concessions lately made. I regret to have to report a continued bad state of trade to Indian and Chinese ports, the supply of steam tonnage out being far in excess of the demand. In spite of the present keen competition in rates to American ports I hear of the establishment of yet another line of steamers to Boston; this will, of course, be most beneficial to shippers, who should not neglect to avail themselves of the cheap opportunities while they last."

The American liners from the Mersey have now reduced their freights on tin plates to 5/ per ton, but even this figure is not sufficiently low to draw much more tonnage that way, the advantage being still with the British Channel ports. There are two steamers now fixed to sail from Newport this and next week, in addition to those that sail weekly from Swansea. Steel is very quiet, generally speaking, and no great amount of new business appears to have been booked in any quarter for some time past. The crucible-steel houses at Sheffield are anything but busy, the only concerns at all well engaged being those with brands of exceptional repute, and those with specialities in forgings and castings. The Bessemer concerns are pushing their rolled sorts with increased vigor now that the rail mills are slacker, and are keen competitors one with another, as well as with the producers of the lower grades of cementation steel. The Siemens works are reported to enjoy a satisfactory amount of business for general and special sorts of that class of mild steel. Steel rails are again unchanged at the late price of £4 15/ at the works, for ordinary heavy sections, and other kinds on that basis. Few new orders are being given out, and work in some quarters is becoming very scarce. I have not heard that a recommencement has been made at the Eston establishment.

SCOTCH PIG IRON

was very quiet after the holiday, and opened on the week with a loss of several pence in the quotations for warrants. This laguer continued until toward the end of the week, when it transpired that considerable orders had been placed for new ships. Prices then moved up somewhat, and the general tone of the market became steadier and more hopeful. There are now 95 furnaces blowing in Scotland, as against 114 last year. In Connal's stores the quantity of pig iron is 586,991 tons, as compared with 584,438 tons again last year. Shipments last week again showed a heavy comparative decrease, and the aggregate to date is 46,505 tons behind last year. Imports of Middlesboro' pig iron into Scotland are 7110 tons in arrears.

MIDDLESBORO' PIG IRON

is quieter and rather lower in price, owing to the continued dullness of all the local manufacturing industries, the decreased shipments and the unfavorable returns for July. G. M. B. quotations, f.o.b. at makers' wharves in the Tees are:

No. 1 Foundry	40/6	Mottled	35/6
" 2 "	39/7	White	34/6
" 3 "	36/6	Refined metal	32/6
" 4 "	36/6	Kentledge	30/6
" 4 Forge	35/6	Cinder	33/6

THE BOARD OF TRADE RETURNS

for the month of July are somewhat less unfavorable than had been anticipated, although they afford additional proofs of the steady decline of average values. The imports were of the total value of £34,203,416, as against £34,320,066 in July, 1883, and £34,659,779 in July, 1882. The exports last month aggregated £21,039,922, as compared with £20,317,724 in July, 1883, and £21,374,978 in the same month of 1882.

The Italian laborers' method of circumventing the oppressions of capital certainly has the merit of originality. The wages of a gang of Italians laborers, near Saratoga, were recently cut down 10 cents a day. Instead of striking, they cut an inch off their shovel blades at night. The boss asked what it meant, and one the men replied: "Not so much pay, not so much dirt lift; all right, job last the more of long; Italian no fool like Irishman; he no strike."

INDUSTRIAL ITEMS.

MASSACHUSETTS.

A new composition metal, of whose properties great expectations are entertained, is being used by the E. Stebbins Manufacturing Company, at Springfield. It is hard and durable, and for plumbing apparatus is said to have the advantage over plated material of retaining its luster, regardless of wear and tear. It costs from one-third to one-half more than silver-plated and nickel-plated brass goods, but it is claimed that the excess in price is much more than equalled by the greater durability of the new product. The composition is a secret.

NEW JERSEY.

The Spring Hinge Manufacturing Company has been incorporated at Asbury Park, with a capital of \$30,000.

The Dupont powder mills, at Gibbstown, Gloucester County, are practically closed on account of the small demand for powder.

The molders employed by R. M. & H. B. Burnet, on Harmon street, Newark, struck on the 21st inst. against a reduction of wages.

The Domestic Sewing Machine Company, of Newark, intend to discharge a number of their employees on account of the dullness of trade. The company will also make a reduction of wages. The workmen have been working eight hours a day about four days in the week. It is the purpose of the superintendent to keep the retained force at work 10 hours a day for a week's work so that the men can earn as much at the reduced wages as before.

NEW YORK.

The American Electric Arms and Ammunition Company have been incorporated in New York City for the purpose of patenting, manufacturing and selling arms and ammunition, especially with the application of electricity thereto. The capital stock is \$1,000,000. The trustees for the first year are George B. Satterlee, William H. Barbour, James S. Merriam, Ethel C. Hine, Charles H. Tompkins, Thomas L. Watson and John W. Hedenberg.

The United States Combustion Company filed their certificate of incorporation on the 21st inst. in the office of the New York County Clerk. Their objects are to manufacture and sell locomotive and other steam boiler furnaces. The capital stock is \$250,000, and provision is made for its increase to \$1,000,000. The trustees for the first year are William Westlake, Thomas Keech, Warren U. Reynolds, Arthur J. Griggs and Wellesley W. Gage. The certificate of incorporation of the Curtiss Sewing Machine Company was also filed. The capital stock is \$200,000. The trustees for the first year are George W. H. Curtis, Thomas O. Curtis, Isaac Lloyd, William Bartlett, William H. James, Frank Loughlin, J. Trumbull Smith, Walter Lipe and W. B. Dowd.

The committee of creditors of the West Point Foundry Association and of Paulding, Kemble & Co. have reported that the assets are largely in excess of the liabilities, and they recommend the acceptance of notes at 9, 12 and 18 months, provided that 80 per cent. of the creditors agree.

PENNSYLVANIA.

An Associated Press telegram, dated the 22d inst., says that the Lancaster Bolt Company made an assignment on that day. Liabilities, \$67,000; assets, \$28,000.

The principal purchasers of the personal property of the Kemble Coal and Iron Company, in Bedford County, have been Nimick & Co., of Pittsburgh, who also have the largest judgment and first execution. It is understood now that the works will be kept running, probably under the contract of Nimick & Co.

A very interesting test was made a few days ago, at the Empire Chain Works, of Bradlee & Co., of Philadelphia, who are furnishing the cable for the Astor yacht. This is the first cable ever made in this country and accepted by the British Lloyds, under which bureau the yacht is classified. Before beginning, the inspector required the testing machine to be verified by actual test. This having been accomplished satisfactorily, three links were cut from each section and tested until they broke. The result of the test was as follows:

No. 1 broke at	133,850 pounds
No. 2 "	148,450 "
No. 3 "	144,500 "
No. 4 "	135,000 "
No. 5 "	135,200 "
No. 6 "	135,150 "
No. 7 was tested to	135,500 "

and did not break. As the law requires that the pieces shall be tested to the appropriate breaking strain (which, for this size, viz., 1½ stud, is 174,992 pounds), and the inspector having broken the above number, he tested the remaining pieces to 130,000 pounds each, and all having stood the test without breaking, the 16 lengths, having had the three links replaced, were tested to the proof strain, viz., 83,328 pounds. It will be seen, therefore, that No. 7 having been tested to 155,500 pounds without parting, gave an excess of 30,508 pounds above the breaking strain and 72,172 pounds above the proof strain.

The Salter Brothers, boiler-makers, of Pottstown, have purchased six acres of ground, upon which they will erect additional works.

The shafting, pulleys and hangers for the Electrical Exhibition, in Philadelphia, will be furnished by George V. Cresson, of the Philadelphia Shafting Works, and he will also furnish the shaftings for the State Fair.

The lining of one of the Stewart Iron Company's blast furnaces, at Sharon, fell in on July 15, necessitating the blowing out of the furnace.

The Thomas Iron Company have blown out their No. 8 Furnace at Alburtis, Lehigh County.

The furnace of the Warwick Iron Company turned out for the week ending Saturday, August 16, 507 tons of pig iron. This

is an unprecedented yield for this furnace, which is given to big yields. The largest amount turned out in any one week previous to this was 494½ tons. The furnace has been in blast for over three years.

The blowing engine built by the Weimer Machine Works Company, of Lebanon, for Ferguson, White & Co., of Robeson, is being shipped. The firm have also received orders to build one of their large-sized blowing engines for the Paxton Furnace and another for the Lochiel, of Harrisburg.

Neshannock Furnace, at New Castle, owned and operated by the Crawford Iron and Steel Company, has been shut down indefinitely. A new blowing engine and a new battery of boilers are to be put in, and other improvements made, during the "lay off."

A portion of the stock of one of the Sheridan Furnaces, owned by Wm. M. Kaufman & Co., of Sheridan, Lebanon County, fell in on August 21, while the workmen were engaged in repairing it. The damage is about \$5000, and the stock will be rebuilt at once.

The repairs to the Birdsboro Nail Works of the E. & G. Brooke Iron Company have been completed and they are again in operation.

PITTSBURGH AND VICINITY.

The drill at Chess, Cook & Co.'s gas well has descended to a depth of 675 feet. A strong flow of salt water has been struck, which interferes with the drilling to some extent. Casing was put in last week, but it had to be removed to allow the use of a larger drill.

The Pittsburgh Diamond Stone Saw Company were granted a charter on August 22, which sets forth the capital of the company at \$100,000, and names the directors as W. H. Lee, Hugh Lee and R. H. Brown, of Mansfield, Allegheny County; J. B. Fife, of Idlewood, and Edward Fisher, of Pittsburgh.

The Coal Valley Coal Company, composed of Capt. Jos. A. Stone and his four brothers, have asked for an extension of credit. A member of the concern stated that, until a proper statement could be made, it was deemed best to say nothing for publication further than that, if given reasonable time, the firm could pay every dollar of their indebtedness. The company own some valuable coal lands, and the mines in operation are well equipped. They also own the steamboats Coal Valley, William Stone, John A. Stone and Dauntless.

The Dunbar Coke Company, Limited, have filed a deed of voluntary assignment. The works of the company are located in Fayette County. The total liabilities will be in the neighborhood of \$35,000. Their coke works and coke field in Fayette County cost the company in 1880 \$95,000, but the property has depreciated considerably in value since then, and according to the estimate of the president of the company is not worth now more than \$65,000. The company were organized in 1880, with a capital stock of \$100,000. The cause of the assignment was the great depression in the coke trade. It is thought the company will be able to settle with their creditors dollar for dollar, and that it will not be many weeks before the firm will be able to commence operations again. The assignment did not create much excitement in coke circles.

It is rumored the Keystone Rolling Mill Company have purchased property on Second avenue, and will put up a wrought-pipe mill.

Owing to a break in one of the natural-gas mains, on account of which the gas had to be turned off, several South Side mills and glass houses were compelled to suspend operations last Thursday, the occurrence causing them much inconvenience.

There was a full attendance at the meeting of the Connellsville Coke Producers' Association, at J. D. Boyle's office, in the Lewis block, on August 20. It was decided not to decrease the output of coke. A falling off of 2000 cars in the July shipment as compared with June was reported. There was \$100,000 in the syndicate account for distribution. The restriction percentage remains at 45 per cent., which is really no greater than the previous restriction of 25 per cent. and two days idle each week, as the ovens are run all the time now.

The syndicate gas well on the property of Park, Bro. & Co. is giving its projectors considerable trouble. A 2-inch discharge-pipe was sunk into the well, when it was discovered that the brine and gas both came from the same layer of sand, and that salt water came through the pipe in a thick stream. It has been decided to put the 4-inch casing in again and resume drilling once more.

A union operative is responsible for a story to the effect that the strike at De Haven's foundry will be concluded shortly in favor of the union men, all of which was denied by a member of the firm when spoken to. Last week four more union men went to work, and it is said that several more will soon commence. At the other foundries there is no change in the situation.

The coal operators of the Monongahela Valley announce their intention to secure free lockage for their coal when shipping it by water, and they will probably memorialize the Government.

The tipping of a vessel filled with molten metal last week was the cause of a slight fire at the foundry of Jas. B. Young & Co. The flames were quickly extinguished, and the damage will not be over \$100.

Furnace "A," 13 x 60, of the Edgar Thomson Steel Works, under the management of J. H. Creamer, after being relined, was blown in on Spiegel on August 10. She is now making a daily product of from 45 to 50 tons of ferromanganese, which analyzes from 80 to 88 per cent. of manganese, the silicon being as low as ¼ of 1 per cent. The ore used is chiefly West Virginia ore.

OHIO.

The Standard Tool Company, Cleveland, have completed their preparations to manufacture twist drills, and by September 1 will

have a complete assortment of taper-shank drills. They have 55 hands at work. The services of five experts have been secured by them, with W. A. Babcock, of Bishop & Babcock, as general manager. They are now furnishing twist drills from No. 80 to ½ inch.

The H. P. Nail Company, of Cleveland, will occupy their new rod mill by October 1.

Judge Pearce, of Steubenville, after hearing all the arguments in the Steubenville Furnace and Iron Company case, has decided that if the stockholders shall pay to the execution creditor, within five days, the amount of his judgment and the costs of the sale, the sale should be set aside; otherwise to be confirmed. The costs of the sale will approximate \$500, while the bonded indebtedness of the company is \$58,000 and is increasing every year by interest, insurance and taxes. It is not known yet whether the sale will be set aside or not.

From some cause the gas well which supplies the Jefferson Iron Works, of Steubenville, gave out last week and the works were compelled to shut down. It is not known whether the stoppage of the flow will be only temporary or permanent.

ILLINOIS.

Owing to rapidly accumulating orders for their new nut and bolt threading machines, J. W. Adams & Co., of Chicago, have been compelled to double their capacity by the purchase of new lathes, shapers and other machines.

The new works of the Lambert & Bishop Wire Fence Company, at Joliet, are completed and in operation, and will be running to their full capacity by September 15 in their galvanizing, drawing and fence-wire departments. The company will use vapor fuel, instead of gas and coal, for annealing. The gas is made from crude oil or petroleum, with the paraffine extracted with steam, the oil being vaporized. Very economical results are anticipated.

The McCormick Harvesting Machine Company, of Chicago, are erecting a three-story warehouse on Leavitt street.

The Illinois Agricultural Works, of Springfield, capital stock \$300,000, were incorporated last week by L. H. Coleman, C. H. Post and W. T. Reed.

The Dean Steam Pump Company, of Chicago, have just started their two-and-one-half million compound condensing and pumping engine at Ottumwa, Iowa.

The works of the June Manufacturing Company, of Chicago, which have been shut down for the past six weeks, started up on the 18th inst.

MICHIGAN.

The Albany, the first steel vessel ever built on the lakes, was launched at Wyandotte on the 22d inst. She measures 282 feet over all, and her carrying capacity is 2500 tons. She was built for the Western Transit Company, of Buffalo, and was designed for the carrying trade of Buffalo and Chicago. She is expected to make 12 miles an hour. Her cost was \$200,000. The steel plating is from ½ to ¾ inch thick.

MISSOURI.

Niedringhaus & Co., of the St. Louis Stamping Works, have started up their rolling mill.

The St. Louis Hot Pressed Nut and Bolt Manufacturing Company resumed operations this week, having recovered from the temporary embarrassment which prompted them to make an assignment on July 18. The secretary of the company states that they paid 100 cents on the dollar.—*Age of Steel.*

The Laclede Wire and Fence Company, of St. Louis, are about putting a new 65-horsepower engine into their factory. This, with other improvements and additions which they expect to make, will double their capacity.

The Collier Shot Tower Company, of St. Louis, will probably be making shot by October 1.

MINNESOTA.

The Duluth and Iron Range Railroad have entered into a contract with the Wilson Line of boats for the shipment of 100,000 tons of iron ore from Five Harbors to Lake Erie ports.

The Minneapolis Glass Company have been organized, with a capital of \$75,000, the first installment of 10 per cent. paid in, and the organization perfected by the election of C. P. Hazeltine president and R. J. Mendenhall secretary. The company have bought out the Suffolk Glass Works, of Boston, Mass., all of whose molds, patterns, patents, &c., are to be transferred to Minneapolis. A superior quality of sand is found at Minneapolis on the river and it has been practically tested. Glass pitchers, goblets and other ware made of the same are now on exhibition.

MARYLAND.

The Pneumatic Gun Carriage Company, of Baltimore City, have been incorporated by Frederick H. Paine, Charles E. Creery, Charles C. Lancaster, Richard B. Evans and Edwin C. Fawcett. The corporation is formed for the purpose of manufacturing and selling gun carriages under letters patent to James A. Pawlett for improvements in carriages for ordnance, and will have a capital stock of \$250,000.

TENNESSEE.

The Tennessee Coal, Iron and Railroad Company, it is said, have closed a contract with H. F. Debardeleben, of Alabama, for the delivery of 300 tons of iron ore daily for five years. The price is not stated, but fully \$300,000 is involved in the transaction.

ALABAMA.

The Alpine Iron Company is the name of a new corporation, with \$200,000 capital, which has been organized to erect a blast furnace at Alpine. O. M. Reynolds is secretary of the company.

GEORGIA.

The Hawkinsville Cotton Compress Company, Hawkinsville, have selected the site for their works and will build immediately.

Packing, Steam.	
Pease, Parson's	do 50
Rotary Knife	do 15, do 10
Diamond State	do 15, do 10
Pencil.	
Faber's Carpenters	high list, do 50
Faber's Round Gilt	do 50, do 25 net
Dixon's Lead	do 50, do 25 net
Dixon's Lead	do 50, do 25 net
Dixon's Carpenters	do 50, do 25 net
Picks.	
Railroad, 5 to 6, 11.00; 6 to 7, 12.00	do 50, do 25
Adze Eye, 5 to 6, 11.00; 6 to 7, 12.00	do 50, do 25
Picture Nails.	
Brass Head, Sargent's list	do 50, do 25
Brass Head, T. & S. Mfg. Co.	do 50, do 25
Porcelain Head, Sargent's list	do 50, do 25
Porcelain Head, T. & S. Mfg. Co.	do 50, do 25
Niles' Patent	do 50, do 25
Pinking Irons.	
Planer and Sane Irons.	
Bench, First Quality	do 25, do 15
Bench, Second Quality	do 25, do 15
Molding	do 25, do 15
Bayley's Stanley R. & L. Co.	do 25, do 15
The Stanley R. & L. Co.	do 25, do 15
Bayley's "Victor"	do 25, do 15
Plane Irons, Buck Bros.	do 25, do 15
Plane Irons, Auburn Tool Co.	do 25, do 15
Plane Irons, The	do 25, do 15
Plane Irons, Sandusky Tool Co.	do 25, do 15
Planers and Nippers.	
Butter's Patent	do 25, do 15
Hall's Pat. Compound	do 25, do 15
Humason & Beckley Mfg. Co.	do 25, do 15
Gas Pliers	do 25, do 15
Eureka Pliers	do 25, do 15
Russell's Parallel	do 25, do 15
P. S. & W. Cast Steel	do 25, do 15
P. S. & W. Throat Nippers	do 25, do 15
Plumbers and Levels.	
Diston's	do 25, do 15
Stanley R. & L. Co. Pat. Adjustable	do 25, do 15
Stanley R. & L. Co. Non-Adjustable	do 25, do 15
Chapin's Patent Adjustable	do 25, do 15
Chapin's Non-Adjustable	do 25, do 15
Standard Rule Co. Non-Adjustable	do 25, do 15
Johnson's Patent Adjustable	do 25, do 15
Pocket Levels	do 25, do 15
Navle's Inclination	do 25, do 15
Post Hole and Tree Augers.	
Samson Post Hole Auger	do 25, do 15
Fletcher Post Hole Auger	do 25, do 15
Eureka Diggers	do 25, do 15
Lead's	do 25, do 15
Vaughan's Hollow Tube Post Hole	do 25, do 15
Kohler's Little Giant	do 25, do 15
Pruning Hooks and Shears.	
Disston's Combined Pruning Hook and Saw	do 25, do 15
Disston's Pruning Hook	do 25, do 15
E. S. Lee & Co.'s Pruner	do 25, do 15
Pruning Shears	do 25, do 15
Wheeler, M. & Co.'s Combination	do 25, do 15
Dunlap's Saw and Chisel	do 25, do 15
Pulley.	
Hot House and Tackle	do 25, do 15
Japanned Screw	do 25, do 15
Brass Screw	do 25, do 15
Japanned Side	do 25, do 15
Japanned Clothes Line	do 25, do 15
Hay Fork, "Anti-Friction"	do 25, do 15
Hay Fork, "F" Common and Pat. Bushed	do 25, do 15
Hay Fork, Tarbox Pat. Iron	do 25, do 15
Shade Rack	do 25, do 15
Pumps.	
Cistern	do 25, do 15
Pitcher Spout	do 25, do 15
Yard and Set Length	do 25, do 15
Punches.	
Saddlers or Drive	do 25, do 15
Bemis & Call Co.'s Cast Steel Drive	do 25, do 15
Bemis & Call Co.'s Spring Drive	do 25, do 15
Spring	do 25, do 15
Bemis & Call Co.'s Spring and Chisel	do 25, do 15
Rail.	
Sliding Door, Wrought Brass	do 25, do 15
Sliding Door, Bronze Wt. Iron	do 25, do 15
Sliding Door, Painted	do 25, do 15
Bar Door, Light	do 25, do 15
Per 100 feet	do 25, do 15
B. D. for N. E. Hangers	do 25, do 15
Rakes.	
Terry's Wrought Iron, 5 ft	do 25, do 15
Razors.	
W. H. Torrey Razor Co.	do 25, do 15
Wostenholme & Butcher	do 25, do 15
Razor Straps.	
Genuine Emerson	do 25, do 15
Badger's (not Emerson)	do 25, do 15
Imitation Emerson	do 25, do 15
Torrey's	do 25, do 15
Refrigerators.	
O. H. Pierce & Co.	do 25, do 15
Challenge	do 25, do 15
Challenge Beer Coolers	do 25, do 15
Rivets.	
Black Iron and Tinned	do 25, do 15
Iron in bulk	do 25, do 15
Iron Carriage Rivets	do 25, do 15
Chained Iron Rivets	do 25, do 15
Copper Rivets and Burns	do 25, do 15
River Sets.	
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15	do 25, do 15
Rollers.	
Bar Door, Sargent's list	do 25, do 15
Acme (Anti-Friction)	do 25, do 15
Rope.	
Manila	do 25, do 15
Manila, 1/2 inch and larger	do 25, do 15
Manila, 3/4 inch and larger	do 25, do 15
Manila, 1 inch and larger	do 25, do 15
Manila, 1 1/2 inch and larger	do 25, do 15
Manila, 2 inch and larger	do 25, do 15
Manila, 3 inch and larger	do 25, do 15
Manila, 4 inch and larger	do 25, do 15
Manila, 5 inch and larger	do 25, do 15
Manila, 6 inch and larger	do 25, do 15
Manila, 7 inch and larger	do 25, do 15
Manila, 8 inch and larger	do 25, do 15
Manila, 9 inch and larger	do 25, do 15
Manila, 10 inch and larger	do 25, do 15
Manila, 11 inch and larger	do 25, do 15
Manila, 12 inch and larger	do 25, do 15
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Manila, 85 inch and larger	do 25, do 15
Manila, 86 inch and larger	do 25, do 15
Manila, 87 inch and larger	do 25, do 15
Manila, 88 inch and larger	do 25, do 15
Manila, 89 inch and larger	do 25, do 15
Manila, 90 inch and larger	do 25, do 15
Manila, 91 inch and larger	do 25, do 15
Manila, 92 inch and larger	do 25, do 15
Manila, 93 inch and larger	do 25, do 15
Manila, 94 inch and larger	do 25, do 15
Manila, 95 inch and larger	do 25, do 15
Manila, 96 inch and larger	do 25, do 15
Manila, 97 inch and larger	do 25, do 15
Manila, 98 inch and larger	do 25, do 15
Manila, 99 inch and larger	do 25, do 15
Manila, 100 inch and larger	do 25, do 15

Sausage Stuffers or Fillers.	
Miles' "Challenge"	do 25, do 15
Draw Cut No. 1	do 25, do 15
Enterprise Mfg. Co.	do 25, do 15
Silver's	do 25, do 15
Saws.	
Diston's Circular, Mill and Cross Cut	do 25, do 15
Diston's Hand, Panel, Rip, &c.	do 25, do 15
Boynton's Lightning Cross Cuts, new list	do 25, do 15
Boynton's Circular and Mill	do 25, do 15
Boynton's Job	do 25, do 15
Boynton's Lightning Hand, Panel and Rip	do 25, do 15
Wheeler, Madden & Clemson Mfg. Co.'s Hand	do 25, do 15
W. M. & C. Champlin X Cuts, Regular	do 25, do 15
W. M. & C. X Cuts, Thin Back	do 25, do 15
Livingston's Butcher and Kitchen	do 25, do 15
Livingston's Framed Wood	do 25, do 15
Per doz.	101 102 103 104 105
Simond's Circular	do 25, do 15
Simond's Crescent Ground Cross Cut, patent	do 25, do 15
Simond's Circular and Mill	do 25, do 15
Peace Hand, Panel, Rip, &c.	do 25, do 15
Peace Cross Cuts, Standard	do 25, do 15
Peace Cross Cuts, Thin Back	do 25, do 15
Peace Butcher Saw	do 25, do 15
Richardson's Circular	do 25, do 15
Richardson's Mill	do 25, do 15
Richardson's Cross-Cut, thin back	do 25, do 15
Richardson's Hand Panel, Butcher and Web	do 25, do 15
Barry's Circular	do 25, do 15
Saw Frames.	
White, Vermont	do 25, do 15
Red, Polished and Varnished	do 25, do 15
Saw Rods	do 25, do 15
Saw Sets.	
Boynton's Patent X Cut, Hand Saw	do 25, do 15
Stillman's Genuine	do 25, do 15
Stillman's Imitation	do 25, do 15
Stillman's Lever	do 25, do 15
Stillman's No. 1, 1.50; No. 2, 1.75; No. 3, 2.00	do 25, do 15
Nash's	do 25, do 15
Hammer, Hotel	do 25, do 15
Hammer, Bemis & Call Co.'s	do 25, do 15
Bemis & Call Co.'s Lever and Spring Hammer	do 25, do 15
Bemis & Call Co.'s Plate	do 25, do 15
Bemis & Call Co.'s Cross Cut	do 25, do 15
Alken's genuine	do 25, do 15
Alken's Imitation	do 25, do 15
Alken's Patent	do 25, do 15
Diston's	do 25, do 15
Morrill's	do 25, do 15
Croft's	do 25, do 15
Scales.	
Hatch, Counter, No. 171	do 25, do 15
Hatch, Tea, No. 161	do 25, do 15
Union Platform	do 25, do 15
Chatillon's Eureka	do 25, do 15
Chatillon's Family Favorite	do 25, do 15
Family, Turnbills	do 25, do 15
Scale Beams, List of January 12, 1882	do 25, do 15
Scale Beams, Custer	do 25, do 15
Scrapers.	
Adjustable Box Scraper (S. R. & L. Co.)	do 25, do 15
Box, 1 Handle	do 25, do 15
Box, 2 Handle	do 25, do 15
Defiance Box and Ship	do 25, do 15
Foot	do 25, do 15
Ship, Common	do 25, do 15
Ship, Providence Tool Co.	do 25, do 15
Screen Corners.	
Porter's Pat. Window and Door Frame	do 25, do 15
Screw Drivers.	
Douglas Mfg. Co.	do 25, do 15
Diston's	do 25, do 15
Diston's Patent Excelsior	do 25, do 15
Buck Bros.	do 25, do 15
Stanley R. & L. Co.'s Black Handles	do 25, do 15
Sargent & Co.'s No. 1 and 2, Forged Blade	do 25, do 15
Sargent & Co.'s No. 3 and 4, Forged Blade	do 25, do 15
Sargent & Co.'s No. 5 and 6, Round Blade	do 25, do 15
Sets interchangeable	do 25, do 15
Champlin	do 25, do 15
Clark's Patent	do 25, do 15
Crawford's Adjustable	do 25, do 15
Screws.	
Flat Head Iron	do 25, do 15
Round Head Iron	do 25, do 15
Flat Head Brass	do 25, do 15
Round Head Brass	do 25, do 15
Brass and Galvanized	do 25, do 15
Japanned, list of Plain Screws	do 25, do 15
Lag or Coach	do 25, do 15
Coach, Patent Gimlet Point	do 25, do 15
Red	do 25, do 15
Machine, Flat Head, Iron	do 25, do 15
Machine, Round Head, Iron	do 25, do 15
Bench, Wood, Beech	do 25, do 15
Bench, Wood, Hickory	do 25, do 15
Hand, Wood	do 25, do 15
Hand Rail, Sargent's	do 25, do 15
Hand Rail, Humason, Beckley & Co.'s	do 25, do 15
Hand Rail, Am. Screw Co.	do 25, do 15
Jack (Wilson's)	do 25, do 15
Scroll Saws.	
Lester, 10.00	do 25, do 15
Hogers, 15.00	do 25, do 15
Scissors.	
American (Cast) Iron	do 25, do 15
Trunking, Pruners	do 25, do 15
Barnard's Lamp Trimmers	do 25, do 15
Trimmers, List, Dec. 1881	do 25, do 15
Heinrich's, List, Dec. 1881	do 25, do 15
Heinrich's Tailor's Shears	do 25, do 15
St. Cutlery Co. St. Trimmers	do 25, do 15
Cast Steel Trimmers	do 25, do 15
Wies, J., & Sons' List, Dec. 1881	do 25, do 15
Wies, J., & Sons' Tailor's Shears	do 25, do 15
Shavers.	
Sliding Door, M. W. & Co., list	do 25, do 15
Sliding Door, R. & E., list	do 25, do 15
Sliding Door, Patent Roller	do 25, do 15
Sliding Door, Patent Roller, list	do 25, do 15
Sliding Door, Russell's Anti-Friction	do 25, do 15
Sliding Door, Moore's Anti-Friction	do 25, do 15
Sliding Door, R. & E., list	do 25, do 15
Sliding Door, Sargent's	do 25, do 15
Sliding Door, Reading list	do 25, do 15
Moore's Anti-Friction (Hanging)	do 25, do 15
Ship Tools.	
L. & J. White	do 25, do 15
Shovels and Spades.	
Ames Shovels, Spades and Scoops	do 25, do 15
Griffith's	do 25, do 15
Old Colony	do 25, do 15
Groom Shovel	do 25, do 15
Hussey, Burns & Co.	do 25, do 15
Lehigh Mfg. Co.	do 25, do 15
Payne Pettibone & Son, list, Jan. 1, 1882	do 25, do 15
R. T. Pettibone, Pat. Shovels, new list	do 25, do 15
Remington's (Lowman's) Patent	do 25, do 15
Sowland's	do 25, do 15
Shovels and Tongs.	
Iron and Brass Head, R. & E., list	do 25, do 15
Iron and Brass Head, P. S. & W., list	do 25, do 15
Polished Steel, new list	do 25, do 15
Slates.	
Square Frames, by case	do 25, do 15
Less than a case	do 25, do 15
Spoke Shaves.	
Distance Metallic	do 25, do 15
Wood	do 25, do 15
Wood, list, new list	do 25, do 15
Stearns	do 25, do 15
Spoke Trimmers.	
Bonney's	do 25, do 15
Stearns	do 25, do 15
Ives	do 25, do 15
Douglas	do 25, do 15
Spoons.	
Basting	do 25, do 15
Solid Table and Tea	do 25, do 15
Britannia	do 25, do 15
Sheridan Brit. Co., list	do 25, do 15
Wm. Rogers Mfg. Co.	do 25, do 15
Holmes & Haydens	do 25, do 15
Holmes & Haydens Silver Co.	do 25, do 15
German	do 25, do

METALLURGICAL NOTES.

Utilization of Zinc Flue Deposits.

The following remarks on the utilization of flue deposits formed in the distillation of zinc are from a paper by Dr. Kosman, which appeared in a German publication, the translation being printed by the British Institution of Civil Engineers in their "Abstracts of Foreign Papers": About 1865 the old method of drop condensation in open receivers was abandoned in the Silesian zinc works, and the Belgian system of tubular collectors and closed fume catchers was substituted, and this change has now become general. In these the zinc vapor escaping condensation in the first tube is collected, forming a very freely-divided dust of a gray color, which is pyrophoric, and consists mainly of finely-divided zinc, with some cadmium and lead, and as the zinc is mostly in the metallic state it forms a valuable by-product in the manufacture. The dust collected during the first six hours of the distillation contains nearly the whole of the cadmium in the charge, and is put aside to be utilized as a source of that metal by a fresh distillation, in which, however, the bulk of the lead and zinc are lost. This process is confined to a small number of works. The ordinary dust, also containing a certain amount of cadmium, is either returned to the zinc retorts or sold for chemical purposes (as a very energetic reducing agent), its use being determined by the state of the market for zinc and zinc dust respectively. The amount of zinc dust produced of the ordinary quality, with charges yielding 9 to 16 per cent. of zinc, is 10 to 14 kg. per furnace with 32 muffle in the 24 hours, or per charge of $\frac{1}{10}$ kg. in each muffle 310 to 440 grams. Of the first, or cadmiferous dust, the quantity is, in round numbers, 300 grams per muffle upon a 16 per cent. yield. The proportion of cadmium averages about 3, but sometimes reaches $3\frac{1}{2}$ per cent. These figures correspond to about 5 or $5\frac{1}{2}$ per cent. of the yield in crude spelter, so that for the whole annual production of Upper Silesia the dust produced is 3035 tons, of which the cadmiferous portion forms about 1240 tons.

Latterly several modifications have been adopted in the method of catching zinc dust, partly for the purpose of obtaining a higher yield, and partly to render the furnace-work more bearable for the workmen, by a better condensation of the metallic vapors. The most important of these are Recha's double condensers, which give a large surface for condensation by the use of a second catcher placed horizontally above the first, and provided with a discharge-pipe leading the undecomposed gases into flue chambers; and Kleeman's condenser with a fire and grate, which resembles the American method of making zinc white, the metallic vapor being burnt as it issues and converted into oxide, which is collected in chambers, so that there is no formation of zinc dust proper. The composition of the products obtained by these different arrangements is as follows:

	I. Zinc dust.	II. First or cadmiferous.	III. Second or average.
Zinc.....	80.000	84.463	
ZnO.....	8.834	4.881	
Cadmium.....	1.651	2.654	
Lead.....	2.018	4.376	
Fe ₂ O ₃	1.022	0.908	
Al ₂ O ₃	0.300		
MnO.....	1.815		
CaO.....	2.804	2.494	
MgO.....	0.675	0.239	
Coal and residue.....	0.230	0.130	

No. I is from Theresienhütte, working poor ores of 9 to 12 per cent. produce for zinc. No. II is from Silesia Hütte, working 16 per cent. ores. Both contain sulphuric acid, but not in weighable quantity.

2. Zinc smoke from the collecting flues, for Silesia Hütte. This is reddish or dirty gray powder, containing

ZnO.....	54.45 = 43.72 zinc.
CaO.....	3.62 = 3.17 cadmium.
PbO.....	12.34 = 11.50 lead.
Fe ₂ O ₃	3.85
SiO ₂ and residue.....	25.72

This is remarkable for the large amount of lead, and more particularly of sulphuric acid, that it contains, the latter having been only found in traces in the first dust collected. The difference is obviously due to the existence of sulphur gases in the zinc flame escaping from the retorts, which are probably to be accounted for by supposing some undecomposed blende to be present in the charge, and, as such gases are in the highest degree inconvenient to the workmen, the general use of such collectors as Recha's, &c., is to be recommended on sanitary grounds.

3. Flue stuff from Kleeman's condenser. This is a white or straw-yellow powder, becoming dirty gray when diffused through water, and greenish in carbonate of ammonia liquor. It is sold for mixing with zinc white. The composition is

ZnO.....	88.30 = 70.82 zinc.
CaO.....	1.46 = 1.37 cadmium.
PbO.....	4.44 = 4.12 lead.
SiO ₂	4.12
Fe ₂ O ₃ and residue.....	1.50

Like the preceding product, it shows a decided proportion of sulphates, but is a valuable material, as containing a large quantity of metallic oxides in a very pure state. As regards the utilization of the products as described above, the author, after describing the methods adopted for their analysis, remarks that the plan of returning the condensed products to the works to be re-melted or redistilled is essentially wrong in practice, on account of the enormous loss experienced, especially in the latter operation, the ordinary loss on distillation in muffles being estimated at 25 to 30 per cent. of the total zinc in the charge. It is therefore suggested that Schnabel's method of extraction, by means of carbonate of ammonia, which has for some time been in use for the working up of residues from the zinc desilverizing at Lautenthal, should be adopted somewhat according to the following scheme: The flue stuff is to be heated with a solution of neutral carbonate of ammonia at 30° or 40° C., the resulting zinc-ammonia solution being drawn off and the residue washed with water, the first washings to be added to the solution, while the last are to be used in making fresh ammonia solutions. The first solution, when sufficiently diluted, is heated for some time to 70° C., until the zinc commences to separate, at which time lead and cadmium carbonate and ferric oxide have gone down. It is

then transferred to the still, where the ammonia is driven off by steam and zinc carbonate precipitates. The mother liquor, when containing sulphate of ammonia, goes back to the dissolving process, in order to increase the proportion of sulphate. The zinc carbonate is filtered, pressed and calcined. The residue of lead and cadmium carbonate is cleaned and washed, to produce oxide of lead, whether the cadmium carbonate is decomposed or not being of no consequence. The roasted mixture is then digested with a solution of sugar of lead, the air being excluded as completely as possible. The solution, when cleared, is decanted from the residue, which is washed with sugar of lead solution. Carbonic acid is then passed through the liquor, which precipitates white lead. The cadmium residue is dissolved in dilute sulphuric acid, and precipitates in sulphide by sulphureted hydrogen, or it may be dissolved in nitric acid, and the solution evaporated and heated to decompose the nitrate when brown oxide of cadmium is produced. The advantage claimed for the method proposed is that all three metals are brought into value, whereas under present conditions only that of the zinc is taken into account. Especially as regards cadmium it would be advantageous, as as present it is only brought into commerce in the metallic state, while for technical purposes it is used as sulphide or oxide. The preparation of these from the metal involves the use of an expansion solvent nitric acid, so that while metallic cadmium is sold at 9/ @ 10/ per kg., (\$1.02 @ \$1.14 per pound), the sulphide costs 16/. The extraction process, on the other hand, furnishes the oxide of the metal, which can be taken up by cheap solvents, such as sulphuric and hydrochloric acids.

A Process for Producing Phosphoric Iron.

Mr. Jacob Reese, of Pittsburgh, has patented a process for producing a metal high in phosphorus and carbon and low in silicon, the product being especially adapted for use in the basic Bessemer process. The main feature in his process is the application of the open hearth process to the desilicizing of the iron. In the practice of the ordinary open-hearth process there are three distinct periods in which different chemical reactions take place. In the first, or melting, period about 50 per cent. of the silicon and carbon is eliminated; the second period then commences and the metal remains in a state of rest until the silicon is reduced to $\frac{1}{10}$ of 1 per cent., at which point the carbon is attacked and a violent ebullition begins. By the new process it is proposed to work the blast furnace so as to produce the cheapest quality of metal, irrespective of the amount of silicon present, and then run this molten metal into an open hearth and retain it there at a state of rest until the silicon is reduced down to about the $\frac{1}{10}$ of 1 per cent., when the treatment in the open hearth is discontinued, thus dispensing with the first and third periods and retaining the necessary amount of carbon. In the production of the phosphoric metal by Mr. Reese's process the iron ores are first smelted with limestone and carbonaceous fuel, together with suitable quantities of phosphoretic basic slag to phosphorize the metal to the desired degree, in a blast furnace. The amount of phosphoretic slag used should be sufficient to produce a metal containing a minimum of 2 per cent. of phosphorus. This silicious phosphoretic metal is then run into an ordinary silicious-lined open hearth, and preferably treated with oxide of iron—about from 5 to 20 per cent. of oxide to the weight of the metal; or the metal may be treated without the oxide, but in this case desilicization will not be so rapidly effected.

The amount of oxide will depend upon the amount of silicon present in the metal. This treatment should be continued until ebullition takes place and the metal boils, which, it is claimed, is a positive and unerring indication that the silicon has been reduced to the $\frac{1}{10}$ of 1 per cent. The molten metal should then be immediately withdrawn from the furnace. If it is found that dephosphorization takes place to any considerable extent in the open hearth, which will be the case if the bath or slag is highly basic, then, in such case, the metal should not be run out when the silicon is reduced down to $\frac{1}{10}$ of 1 per cent., but the metal should be allowed to remain and boil for about 10 to 20 minutes, which will leave but a trace of silicon, and the carbonic oxide evolved during this continuation of the treatment will decompose the phosphates in the slag and cause the phosphorus to drop back again into the metal. By the means above specified Mr. Reese claims that he is enabled to produce a cast iron containing from 2 to 3 per cent. of phosphorus and only the $\frac{1}{10}$ of 1 per cent. of silicon, and having about the same per cent. of carbon as the metal contained when run out of the blast furnace.

An Improved Heating Furnace.

Mr. E. Windsor Richards, of Middleboro', England, has patented an improved heating furnace which is designed to enable ingots and other articles, such as slabs of steel, to be equally heated for rolling or other purposes with less labor and at less cost than is now usual. For this purpose he employs a heating furnace provided with chambers to contain ingots or slabs in a vertical position, and so connected with one another and with the furnace that heat entering one chamber shall pass over the top of the ingot or slab down over its whole length, then into another chamber, and so on successively, thus heating uniformly all the ingots or slabs contained in the series of chambers without their having to be turned over during the heating process. The furnace may be heated by gas or otherwise. Mr. Richards considers it advantageous to use a gas regenerative furnace, such as the Siemens. A furnace, according to this invention, may be provided with one or several rows of ingot or slab chambers such as referred to above, the end chamber of each row when a gas furnace is employed being connected to an air chamber and to a gas chamber, and each intermediate ingot or slab chamber being in communication with the upper part of that next to it at one side, and with the lower part of that next to it at the opposite side. The tops of ingots usually have, before being reheated, a lower temperature than the other portions. In order to insure sufficient heating of the upper part of each ingot there are provided

division walls between two chambers that are connected at their bottoms, and also a flue regulated by a damper to connect the chambers near their tops. An overhead traveler is provided for depositing the ingots or slabs in and removing them from the vertical chambers.

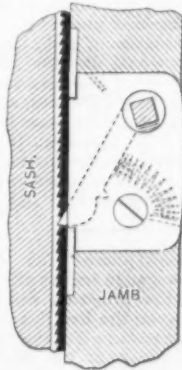
Producing Iron Low in Phosphorus.

P. L. T. von Schöning, of Vienna, has invented a process of making iron, the object of which is to produce pig iron from the blast furnace free or nearly free from phosphorus when working upon ores containing phosphorus. To this end the ores are brought in a heated state into contact with substances capable of forming chemical compounds with phosphorus, which compounds are removed either in the form of gases or slag. The union of the phosphorus with such substances may be effected either in roasting furnaces or in the blast furnace itself. The invention may be carried into effect in different ways, depending upon the local conditions under which it is performed. According to one method, the ores are roasted in admixture with basic materials, such as alkalies or alkaline or carbonaceous earths, limestone, alumina, potash, soda, common salt and the like, and part of the phosphorus becomes combined with these substances. There is also used in the roasting furnace substances which contain elements of the chlorine group. After wasting, superheated steam is forced through the roasted product. When seaweed is readily obtainable it is mixed with the ore and fuel, its iodine and chloride of soda forming gaseous compounds with the phosphorus; the superheated steam also combines with the phosphorus, forming phosphoreted hydrogen, and all these gases escape. The limestone absorbs part of the phosphoric acid, and a similar result follows the use of minerals containing manganese. The materials used to combine with the phosphorus in the blast furnace, and to carry the same away in the slag, are of a basic nature, and consequently the slag will be basic. Basic slags, however, containing limestone and clay are deficient in fluidity, and this difficulty is overcome by adding fluorspar to the charge, which produces an easily-flowing basic slag, and, according to the proportion in which it is used, produces a slag of the required consistency.

HARDWARE NOVELTIES.

The Acme Sash Lock and Balance.

A new form of Sash Lock and Balance, made by the Acme Lock Company, Newark, N. J., and for which Hymes & Hart, 34 Murray street, New York, are the general agents, and Butler & Constant, 18 Warren street, New York, are sales agents, is illustrated in Figs. 1 and 2 of the engravings. The device automatically locks both upper



The Acme Sash Lock and Balance.—Fig. 1.—The Parts for the Upper Sash.

and lower sash at every $\frac{1}{4}$ inch. By this means ventilation and security from intrusion are obtained. By the use of this device sash weights and sash fasts of the common description are avoided, with the advantage of a material saving in first cost. The general features of this lock and balance may be gained from the cuts. The first shows it in the shape applied to an upper sash. The essential parts are a rack, in the form of a light casting screwed to the sash.

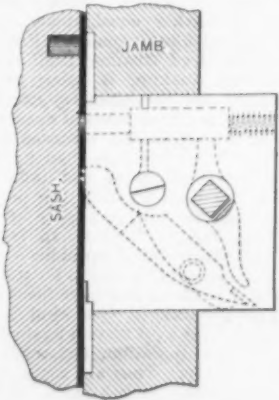


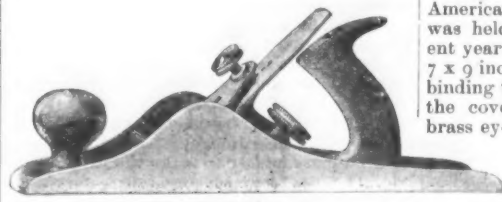
Fig. 2.—The Parts Used on Lower Sash.

The lock is attached to the sash and consists of a pawl controlled by a spiral spring working against the rack. By this it will be seen that the sash may be raised, but cannot be lowered, without lifting the pawl, which can only be done from the inner side. Fig. 2 shows the device arranged for use on a lower sash, and shows an additional feature necessary in that position, namely, a bolt for holding the sash up. The bolt is not depended upon alone to keep persons outside of the house from raising the window, but there is, in addition, the same features of rack and pawl as mentioned above, used, however, in a reversed position. By the arrangement of parts it will be seen that the same movement of the hand of the person opening the window releases both bolt and pawl.

Adjustable Iron Planes.

By means of Figs. 1 and 2 the general appearance and construction of Steer's Adjustable Iron Planes are shown. The special fea-

tures embodied in these tools, which are being introduced to the trade by C. E. Jennings & Co., 96 Chambers Street, New York, are as follows: The bottom of the plane is made in composite form, as shown in Fig. 2. The metal is inlaid with rosewood strips firmly dovetailed, and so combined as to prevent the wood from wearing away. This improvement overcomes the very



Steer's Adjustable Iron Planes.—Fig. 1.

common objection to iron planes, namely, the clinging of the plane to the work when in use. A second improvement is the method of fastening the cutter in the plane, which does away with the heavy short irons used in some planes, and makes it possible to use a heavier cutting-iron, thereby avoiding chattering and enabling the user to adjust the cutter with facility and exactness. A third improvement consists of the method of adjusting the cap iron,



Fig. 2.—Bottom View of Steer's Iron Plane.

by which the cap can be removed and replaced with exactness and without loss of time. These planes are provided with an adjustable mouth, embodying a new method by which the mouth may be made wide or narrow, as the work may require. Several different styles and sizes are made, adapting the planes for general use.

New Egg Poacher.

The accompanying engraving represents a new utensil for kitchen use, known to the trade as the Adams Egg Poacher. This article is the invention of a practical housekeeper, and was produced after long years of experience. It is claimed to do away

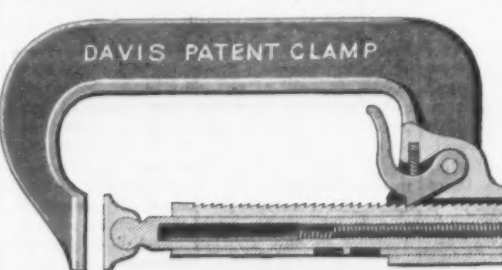


New Egg Poacher.

with all the difficulties that attend the old method. It is said there is no wasting or spreading of the eggs, that they require no attention while cooking, and when done can be drained perfectly dry without being disturbed. The results are to produce eggs more palatable and inviting in appearance, each egg being perfectly round. The utensil is useful for other purposes than the one specifically described. The outside basin is a 4-quart pan and made of 1 X tin, and is of the size commonly used in puddings, custards, &c. It is manufactured by the Adams Manufacturing Company, corner of Main and Sycamore streets, Cleveland, Ohio.

New Form of Clamp.

F. Armstrong, of Bridgeport, Conn., is manufacturing a new form of Clamp, known as the Davis Patent Clamp, a sectional view of the working parts of which is afforded by the illustration herewith. In its general features and in the results accomplished it is not unlike some of the quick-motion vices now prominently in the market. This clamp has the special advantage over others that it clamps the work without displacement. The plunger or screw does not turn the adjustable jaw, but is forced directly on the work by the thumb-screw. By examination



New Form of Clamp.

of the engraving it will be seen that the jaw is readily adjusted to the work by slipping the barrel of the screw in or out, which is made possible by simply raising the lever shown near the center of the cut. When the clamp has been adjusted in this manner as near as may be, the lever is released and the work clamped in the usual manner by means of the thumb-screw. One great advantage of the clamp is the speedy release of work. This may be accomplished by first turning the thumb-screw enough to loosen it and then raising the lever and withdrawing the barrel by hand. The traverse of the thumb-screw is comparatively short, and just what it is always indicated to the operator by means of the pin shown in a slot in the barrel near the bottom of the en-

graving. Several sizes are made, adapting the article to various uses. The clamps are of malleable iron and well made.

Some Things in and About Buffalo.

The above title has been given to the very handsome souvenir, which has been recently issued, of the annual convention of the American Society of Civil Engineers, which was held at Buffalo June 10-13 of the present year. It is an oblong volume, measuring 7 x 9 inches. In place of the conventional binding the various sheets composing it, with the cover, have been fastened together by brass eyelets. A blue silken cord, with tassels drawn through these, serves to complete the work, and adds very much to the effect. The first page of the cover has for a center piece a distant view of the city. This is surrounded by a

blue border, while in a scroll, fancifully worked at one end, appears the title in irregular lettering. The groundwork of the page is a tint between straw color and buff, with patches of bronze, irregular in form, worked in and about the letters scrolls and picture above referred to, in a way to present one of the most attractive compositions that it has been our fortune to examine in a long while. The pages within the volume are no less dainty and interesting than the cover. The title page is worked in red and blue, with illuminated initial letters. The pages of the text following are also worked in two colors. By way of preface we are informed that the work was compiled under the direction of the committee of resident members of the Buffalo Merchants' Exchange. Following this is a list of the several committees, and then we reach the subject matter of the work.

Various buildings, public and private, docks, elevators, engineering works, parks, &c., in and around Buffalo are presented by very handsome photo-prints, and are briefly described in the elegantly printed letter-press. No less than 14 views are presented, all of which were produced from photographs specially prepared for this work by George Barker, of Niagara Falls. Interspersed with the particulars concerning the various views are many items of statistical importance, making the volume one of value, as well as of interest, on account of its art features. The last page of cover is worked in the same colors as the first, already described, and contains in some scrollwork, combined with a fac-simile of the badge of the society, the following: "Annual Convention of the American Society of Civil Engineers, at Buffalo, June 10-13, 1884." This souvenir, which we are sure will be prized by all who are so fortunate as to obtain a copy, has been published and copyrighted by Messrs. Matthews, Northrup & Co., of Buffalo. We have had occasion to refer to the excellent work which this firm is producing on former occasions. It seems as though every new thing which they put out is handsomer than its predecessors. The taste and care with which the present work has been prepared speak in the highest terms of the artistic ability and mechanical resources which this firm possesses.

At the Springfield Armory.

About 120 old-style muzzle-loading 58-caliber Springfield rifles are now dismantled at the armory daily, says the Springfield (Mass.) Republican, and such parts as fit the new breech-loading model are reused. The guns thus taken to pieces are part of the 500,000 old-style rifles made at the armory during the war and stored there unused after 1865. The dismantling began in 1868, when it was found that the whole gun could be sold in the market for only \$1.50, while the parts which could be used in the new model, together with the sale of the remainder as scrap iron or to shotgun-makers, would net the Government about \$4. The parts sold are mainly the stock and barrel and scrap material, and most of these parts go to manufacturers of cheap shotguns. The Whitney Company, of New Haven, and the Remington Company, of Ilion, N. Y., are large buyers. The 50-caliber rifles, which were first made in 1866, of which only 50,000 were manufactured, were never stored, but went at once into active service and have been mainly worn out in it. There are now stored at the armory about 50,000 of the 58-caliber model, and 158,000 dismantled barrels and 128,000 stocks. About 50,000 "cleaned and repaired" 58-model rifles are also stored, but will not be dismantled, as they are mainly contract guns and have seen such rough service in the field as to make it inadvisable to use their parts in new rifles.

The Russian Government is evidently impressed with the necessity of guarding the health of children, as the new factory law imposes the following restrictions on their employment: First, children of the age of from 10 to 12 years are only permitted to work during the day in certain specified industries; second, children from 12 to 15 years are to be allowed to do night work in spinning and textile factories, as well as in glass works; third, work is formally forbidden to children under 15 years in the following branches of industry, among others, in mills where lamb's wool, felt, hair, feather and down are worked up; in bleaching works; in washing, bleaching, and dyeing; in cloth mills, near fulling, tusseling, and shearing machines; in printing and dyeing works; in all unhealthy work in colors; in skin and parchment works, except in some safe employments; in varnishing leather, in grinding bones, in carbonic and turpentine products; in potteries and china works—for the preparation of material, turning, engraving, polishing and baking.

The History of Photometry.

The following history of photometry is from the report of the Scientific Commission at the Munich Electrical Exhibition:

Photometry is a subject which has developed with the electric light. Formerly it did not appear to offer any great difficulties, and it has consequently been treated somewhat superficially in our text-books of science. For the electrician, photometry has a two-fold importance; the function of the photometer is, firstly, to show what quantity of light a certain lamp supplies, so that its economy may be judged; and, secondly, to demonstrate the relations between the light produced and the other forces at work in a given system of machines and lamps. It was only when this latter point became better understood that photometers began to engage the attention of the electrician.

The first photometric tests referred to in text-books of science generally are those of Fizeau and Foucault, of 1843. It must, however, be borne in mind that what these eminent scientists originally measured is not that which really interests us at present in such experiments; the decomposition of an iodine and silver combination, by means of light from various sources, indicated the chemical intensity of the rays, but not the optical intensity. The surprisingly low chemical intensity of the limelight caused MM. Fizeau and Foucault to repeat their experiments in order to determine the optical energy; and the agreement of the new and old figures suggested to them that for white light two determinations might practically be replaced by the one which is more convenient, that is the chemical test. It is evident, however, and needs no further support in these days, when we photograph the invisible ultra violet spectrum, that chemical tests cannot be relied upon, and that photometers like Becquerel's electro-chemical actinometer, or Siemens' selenophotometer, cannot measure the illuminative power of a source of light, however perfect and ingenious they may be in other respects. We have still to depend upon the physiological action of the light rays upon the retina of our eye, untrustworthy as this may be, since different observers are not equally sensitive to the same degree, and even the same observer is not so at all times.

The photometric researches of Th. W. Casselmann, of Marburg, are of interest for the electrician, because they included the electric light, because they were prior to those of Fizeau and Foucault, and because in them there was first introduced Bunsen's photometer, in favor of which Casselmann decided against Ritchie and Rumford.

No accurate tests appear to have taken place after that before 1855, when MM. Lacassagne and Thiers tried their electric lamps at Lyons. M. Edmond Becquerel reported on those trials to the Société d'Encouragement of Paris, and this report led to a contest between the interested parties, as Becquerel estimated the intensity at 350 candles, while the manufacturers claimed 600 and more. This contest was of importance, because the real point was the question of expense. Scarcely any tests of real scientific value were, however, undertaken before the Alliance magneto-electric machines in France, and those of Mr. Holmes and others in England, attracted attention. Then difficulties cropped up everywhere, and the main problem has not been solved up to the present day. Neither the French beccarel, nor the English standard candle, nor the German candle, can be considered as normal, as they are all variable; this is strikingly evidenced by the fact that the ratios between the different standards, as stated in hand-books, do not agree. Many proposals have been made; MM. Riddorf and Methuen suggested that the middle part of a flame, as more steady than the flickering top and the lower zones, ought to be observed; Mr. Vernon Harcourt and others proposed to burn mixtures of air and normal gases, and the former gentleman exhibited a neat normal lamp of about 3-candle power, at the Southport meeting of the British Association. But these devices were mostly too delicate and complicated, and Mr. Louis Schwendler, one of the many electricians whose deaths we have lately had to lament, perhaps made the most practical suggestion in once more drawing attention to Mr. J. W. Draper's idea of using a fine platinum wire, heated by a constant current. Schwendler's units are sheet platinum horseshoes of .017 mm. thick; but these again are open to objections, as we shall find. If we return to our historical abstract, we find M. Tresca, in 1876, experimenting with a Foucault photometer, a modification of Rumford's instrument, which is largely employed in France, and comprises a milk glass disk, whose two halves are illuminated by the lamp to be examined, and the standard candle respectively. Tresca experienced difficulty from the different colors of the lights, and interposed tinted glasses before them. Very instructive were the tests at the South Foreland lighthouses, conducted by Messrs. Tyndall and Douglass, and fully described in the Trinity House Report, 1876-77. The electric lights were compared to a powerful colza oil lamp, kept as nearly as possible constant at 722 standard candles; this comparison was effected by a Bunsen photometer, the colza lamp being again controlled with the help of a Sugg photometer. As the arc itself emits very little light while the greater part comes from the negative carbon, and a smaller amount from the positive, the necessity arose of taking, even with the two carbons vertically above one another, observations in various horizontal planes. M. Allard has further pointed out that even the various points of the vertical plane of the normal candle do not receive equal quantities of light. The report on his very extensive tests at the French lighthouses to the French Ministry ("Mémoire sur les Phares Electriques"), Paris, 1881, forms a very valuable contribution to the literature on photometry. M. Fontaine's observations on photometry, the Gramme machines and Serrin lamps, described in his "Eclairage Electrique," second edition, 1879, also deserve mention for their completeness. Both MM. Allard and Fontaine used Foucault's photometer, and suggested ways to arrive at mean values with very unsteady lamps; these proposals are, however, hardly of practical weight, nor could M. Allard's idea

of verifying his figures, with the help of a Crookes' radiometer, contribute much to their corroboration, as this comes scarcely within the functions of a radiometer. Foucault's photometer was likewise employed when MM. Sautter, Lemmonier & Co., of Paris, were testing their photo-electric apparatus for military operations, the lamps being supplied with Colonel Mangin's aplastic reflector; green glasses were also, in this case, interposed to equalize the colors.

A similar arrangement was adopted at Rouen in 1881, when, on behalf of the Société Industrielle, the systems of Jablochhoff, Gramme and Siemens were subjected to a series of comparative tests. Here, again, a Foucault photometer was used, together with the ordinary beccarel, and the silvered-glass mirror to make the rays parallel. The loss from reflection was averaged at 30 per cent.; the observations were made at various distances, and a determination was made of the radius of that horizontal plane, which received the same quantity of light as a normal candle could supply at a distance of about 4 m. This was a step in the right direction; the report, "Rapport général sur l'Eclairage Electrique des Quais de Rouen," 1881, shows curves drawn to indicate by their ordinates the light falling upon the horizontal plane.

The municipality of Paris has for some years instituted annual tests of the Jablochhoff candles in the Avenue de l'Opéra, which tests finally induced them to abandon those apparatus. The Jablochhoff candles shed their maximum illumination, of course, in the plane perpendicular to the line drawn through both candles; the minimum in this line was found to be .57 of the maximum; the mean intensity, however—not the mean between maximum and minimum—was equal to .9 of the maximum, as the intensity curve proved to be of the shape of a figure 8, and not an ellipsis. It also transpired that the air was less transparent to the red light of the Jablochhoff candles than to the light of rays.

The well-known experiments at Chatham of 1879 and 1880 ought to have been mentioned before this. The apparatus comprised a Rumford photometer and an Argand burner of 40 candle-power, with a Sugg's regulator. Photographs were taken at the same moment of the front and sides of the carbons, and the illuminated areas calculated from these photographs. The average illumination of a point was further derived from these calculations, under the questionable assumption that the light was evenly distributed over the whole plane.

We have already spoken of the difficulty which was met with in comparing lights of different colors. The method of action of the ether vibrations, which excite our optic nerves and create the sensation of sight, is unknown to us, but we know that this function depends upon the wave lengths of the rays. M. Purkinje has shown that two colored planes which appear equally light at a certain distance, seem to lose their light in a different ratio if further removed from the eye. Two lights of different color are therefore incommensurable. Mr. Dietrich has recently, with more perfect apparatus, repeated the tests by means of which Fraunhofer attempted to determine the illuminative power of the various parts of the spectrum, whose lines he so assiduously studied and noted, without in the least conceiving their character and importance. Fraunhofer had only an oil lamp at his disposal, and, just as we should expect, he was wrong by about 9 per cent. with reference to the rays from the line D in the yellow, as here the two lights were most homogeneous, but wrong by 60 per cent. when analyzing the rays from lines B, G and H. Spectrophotometric observations, such as first proposed by Vierordt, Glan and others, may be perfected to a high degree of comparative accuracy; if we arrange the two spectra to be compared above one another, and divide both by vertical lines into bands of one and the same tint, we may indeed achieve very exact measurements. But this can only be executed in the laboratory, and not in ordinary practice, while, after all, it yields only comparative values for the various colors.

Tinted glasses have often been employed to produce rays of equal color; but such interposition means loss. Captain Abney conceived the interesting idea of watching lights through a photographically-prepared glass plate with a scale of darker and darker bands, through the darkest of which even the sun was visible. But in the dark the eye gets slowly capable of distinguishing details which were at first quite indiscernible. Further researches, therefore, convinced Captain Abney that the ratio between red and blue in the same electric lamp varied very considerably as the speed of the generator increased, so that the red rays, which originally were half as strong as the blue ones, finally possessed only one-fourth of the intensity of the blue one, both, of course, increasing in intensity with the quicker revolutions. Professors Ayrton and Perry followed Captain Abney in making two series of tests, choosing, however, red and green lights, instead of red and blue. The difficulty remains, however, how really to compare and reduce to unit measurements those two rows of figures. M. Crova (Comptes Rend. xciii. p. 512) went one step further in this direction. He watched the two half-disks of a Foucault photometer by means of two Nicol prisms, with their main sections vertical to one another, and between the pivots he put a quartz plate 9 mm. thickness. If the two lamps are placed in their proper positions both disks appear of a greenish-white tint, and may then easily be adjusted until equal illumination is attained. The theory of this apparatus is too complicated to be discussed here; the main point is that the quartz is designed to produce two broad interference bands toward the end of the spectra; in the middle parts the intensity of the rays varies, but there must be one line at which the rays pass through the pivots without becoming weakened. This maximum of illumination is now, by adjusting the second pivot, to be fixed at those rays whose comparison would yield the same result as that of the total intensities. The apparatus is ingenious, but in seeking for the districts of equal illumination in the two spectra, it presumes that the spectro-photometer received equal amounts of light from both sources, which anticipates the solution of the problem.

The newer photometers of both M. Cornu and Professors Ayrton and Perry permit measurements of strong electric lamps being taken in small rooms without the awkward necessity of removing powerful lamps to great distances to bring them into comparison with the standard candle. Mr. Cornu intercalates between the rays of both lights an achromatic lens whose active aperture may be widened or lessened with a micrometer screw, and thus varies the quantity of light falling upon the photometer. Apparatus of this kind have often been thought of; the star photometers of Steinheil and Herschel are based upon the same principle. Messrs. Ayrton and Perry, in their dispersion photometer, use a concave lens to decrease the intensity of the rays. No loss of light was supposed to occur through absorption in this concave lens if it were only thin enough. Mr. Voller, of Hamburg, has, however, taken exception to this assumption, and pronounced the possibility of losses of 10 per cent., and Messrs. Ayrton and Perry seem after to have silently admitted this source of error by introducing a plane parallel glass plate between the screen and the standard candle to weaken the intensity of the light standard. The losses through absorption in the air Professors Ayrton and Perry observed to be strongest for green light. MM. Rouquer and Allard have further investigated the phenomena of absorption in air; the coefficients vary greatly with the conditions of the air, but they are sufficiently determined to show that in tests where the strong lamp is 50 m. distant from the screen, a loss of about 4 per cent. has to be taken into consideration.

We have finally to speak of the labors of the third section of the Congress at Paris in 1881. The candle found practically no advocate, although Dr. Werner Siemens declared that a good candle need not vary by more than 5 per cent. MM. Tochikoleff and Bede stood up for Schwendler's platinum unit, but M. Crova objected because platinum had no constant molecular structure, and consequently no constant emissive power; small differences of temperature would further lead to inexact figures. M. Violle recommended the use, as a unit, of the quantity of light radiated by 1 square cm. of platinum at melting point. MM. Werner Siemens and Cornu assented, but preferred silver. Sir William Siemens proposed an iridium wire under the influence of the unit of current. MM. Neujean and Flamache caused slight surprise by praising the magnesium and lime lights. For want of anything better, the old beccarel was finally left in office, although M. J. Dumas pronounced it too weak. The discussions on photometers were less warm. M. Bergé made the curious proposal to remove the lamp until a white screen would no longer be visible through a solution of the sulphate of copper ammonia. The great problem of what to do with reference to the various colors also remained unsettled. M. Allard suggested the creation of a blinking effect, as then all colors would dissolve into one uniform gray, and Dr. Gladstone proposed the employment of long distances, across which the differences of colors would disappear. The proposal of M. Rousseau that for each lamp the equation of the intensity curve $J = f(a)$ should be calculated was warmly supported and accepted.

Railway Equipment for Africa.—A train of narrow-gauge trucks and passenger carriages for the proposed railway across the desert between the Red Sea and Berber, says the London Standard of the 10th ult., are in course of shipment at the Royal Arsenal for Suakin. They were yesterday placed in lighters for conveyance to the Albert docks, and will this morning be taken on board the British India steamship Navarino, which will sail next Wednesday for the East. The passenger trucks will each carry 12 soldiers, and a brakeman on a platform in rear. They are lightly built, with tilt covers, and are open at the sides, but have stout blinds of oiled canvas on rollers, for use if necessary. Although the under carriage is fitted to the narrow-gauge of 18 inches, the body of the vehicle is 6 feet wide, and the seats are balanced over the wheels like those of an outside car. The goods trucks are longer, but not as wide as the passenger carriages, and are more numerous. With them are being sent a further consignment of the railway iron and a large quantity of timber. Meanwhile the hired steamer Dunluce, just returned from Suakin, is being reloaded with ordnance and commissariat stores and a considerable freight of medical necessities. She has drawn from the reserves in the dock yard at Woolwich more than 2,000,000 pounds of preserved meat and other provisions for the men forming the proposed expedition, together with a supply of compressed forage for the horses. In front of the ordnance stores office, specimens of the india-rubber tanks which are to be used for holding water in the desert have been set up and filled for inspection. One kind is completely inclosed, as a protection against contamination and evaporation, but the others are open at the top. They are supported by lashings to ordinary picket posts, and are likely to prove very serviceable in the desert.

From Selling Hardware to Managing Railroads.—Mr. John King, Jr., the new president of the Erie Railroad, was born in Baltimore, was there educated, and is now 52 years old. It may interest our readers to know that he was brought up in a hardware store, and was afterward for two years in the office of the Adams Express Company. In 1854 he entered the employ of the Baltimore and Ohio Railroad as ticket agent at Camden Station. Two years later he was made paymaster, and one year after that he became auditor. Subsequently the duties of general freight agent devolved on him. In 1867 the office of vice-president was created for him. He retired in August, 1881, on account of his health. At the time of his retirement he was receiver of the Marietta and Cincinnati and Ohio and Mississippi railroads, and president of the Pittsburgh and Connellsville Railroad.

Speed on the Ocean.—Again the Cunard steamer Oregon claims the palm as victor in the ocean race between England and the United States. She left Queenstown at 3.21 p.m. on Sunday, August 17, and arrived at Sandy Hook bar at 8.50 p.m. on Saturday, August 23, thus making the passage in 6 days and 10 hours. The distance run each day was as follows:

	Knots.		Knots.
Monday	400	Saturday	449
Tuesday	452	To Sandy Hook	181
Wednesday	436		
Thursday	439	Total	2818
Friday	448		

The fastest previous passage was made by the same vessel last April, the time being 6 days, 10 hours and 10 minutes. The quickest trip made by the American steamship Baltic, of the Collins Line, was 9 days and 13 hours, in the year 1851.

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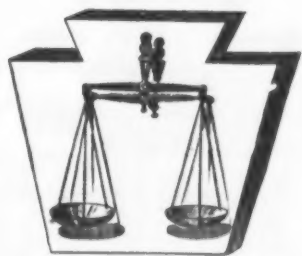
For EASY running and best MOTION it has no EQUAL.

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THE TENSION CAN BE CHANGED to suit the weight of the user in a moment. It is practically and mechanically complete.

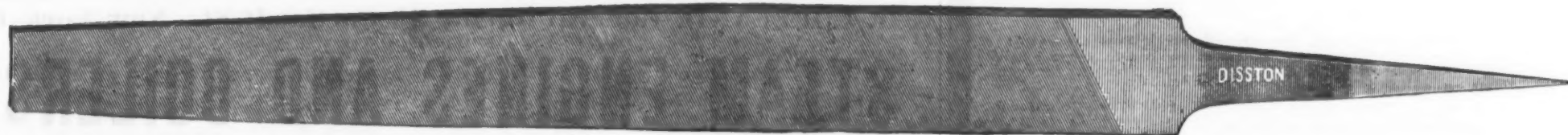
For further particulars, address the
CHAMPION ROLLER SKATE & WAGON CO.,
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HENRY DISSTON & SONS,



KEYSTONE SAW, TOOL, STEEL AND FILE WORKS,

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NEW PROCESS OF SHARPENING FILES AFTER HARDENING.

HAVING secured the right to sharpen Files by an improved process after they have been hardened, we would call attention to a few of its features:

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All cutting tools, except Files, are sharpened after having been hardened and tempered, and while it has been deemed essential that Files should be treated in the same manner, it has been impossible to sharpen the teeth until this recently-discovered method makes it practicable to do so, thus insuring a sharpness that has long been desired, and which cannot be otherwise obtained.

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Rasps and Files for brass and other metals are specially benefited, and all packages containing such Rasps and Files will be labeled sharpened, and day and date when so done.

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PATENTED JANUARY, 1884.

Over Five Hundred Sets Already Under Steam Boilers
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PRONOUNCED A "GRAND SUCCESS."

See what the Chicago, Rock Island and Pacific R.R. Co. are doing:
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"We now use nothing but slack that costs about one-half as much as lump coal, and a carload of slack lasts us fully as long as a carload of coal, which makes the cost of running our boilers with your Grate only about one-half of what it is when run with other coal. They work very nicely, and fire easier than the old-style Grate."

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Twelve months in use.

Bloomington Pork Packing Co. say:

"We could not have got the necessary steam to run our business without them."

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The Mound City Distilling Co. say:

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Mr. C. F. Buckingham, Pres. The Chicago Steel Works, says:

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"Have increased our steam supply over 30 per cent., and relatively reduced our coal bill fully 20 per cent."

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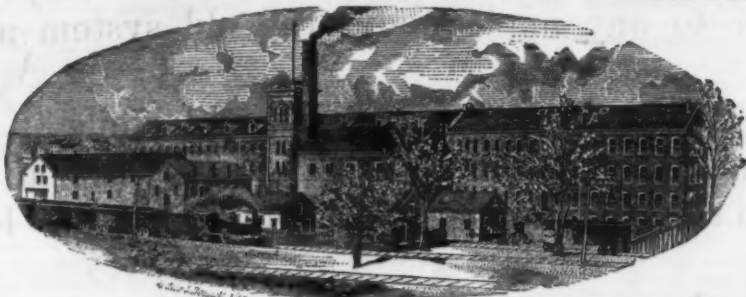
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[SEE THIS ADVERTISEMENT NEXT WEEK.]

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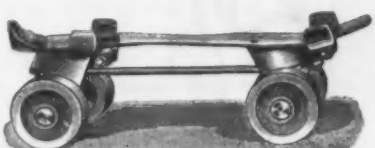
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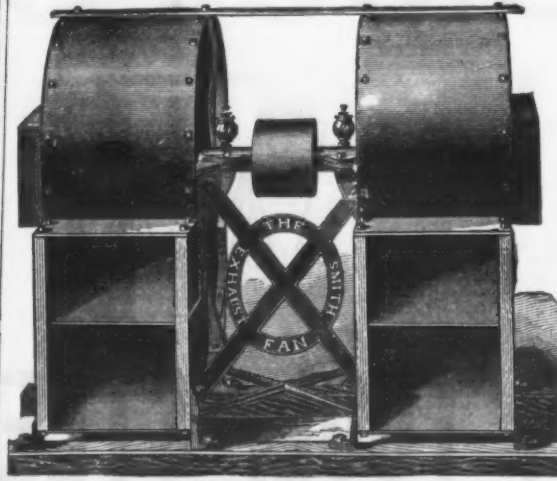
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SAVE 50 PER CENT. IN POWER APPLIED, AS COMPARED WITH OTHER MAKES.



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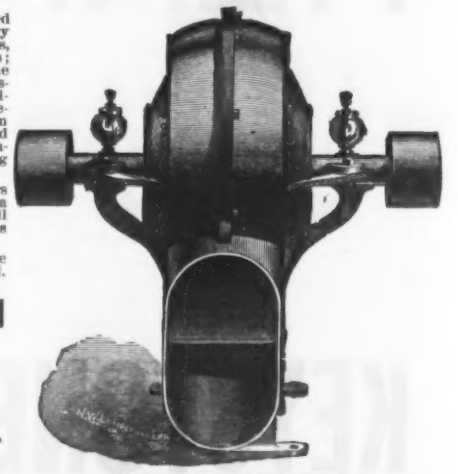
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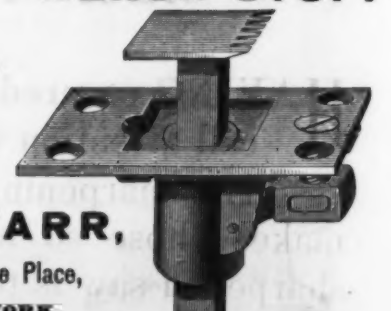
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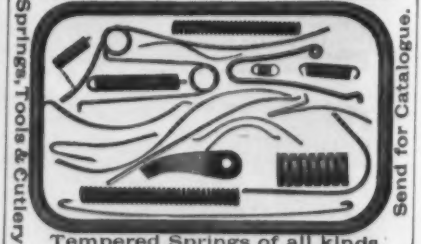
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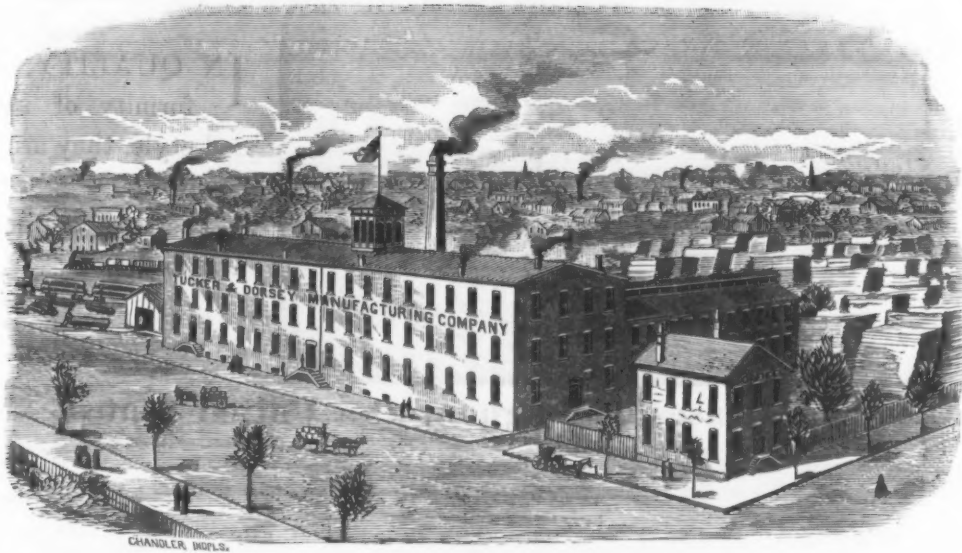
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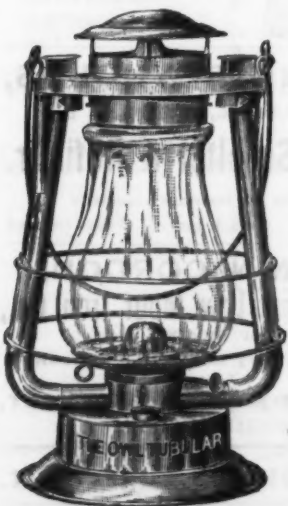
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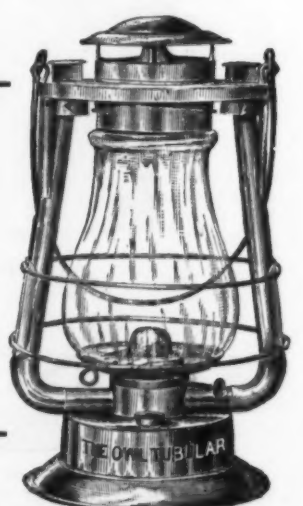
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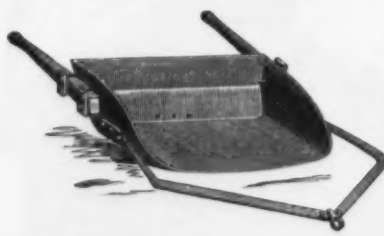
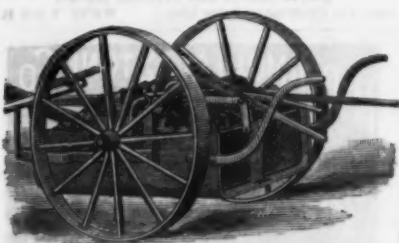
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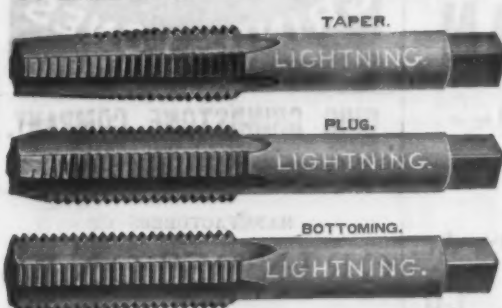
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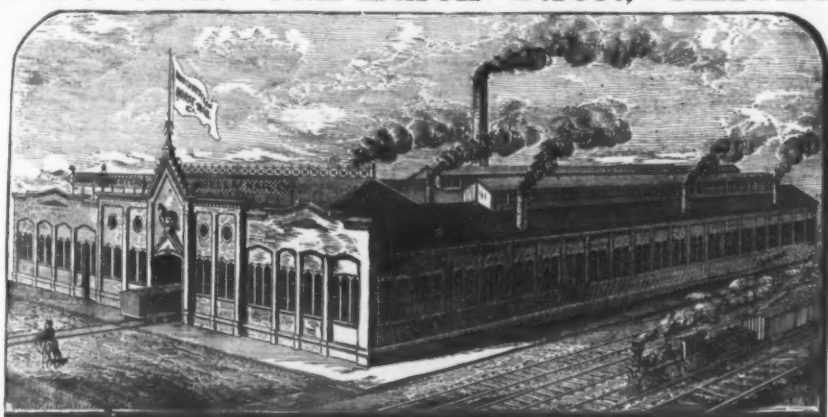
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IN QUALITY, uniformity of shape and style, they are unequalled.

They are the safest nail to drive.

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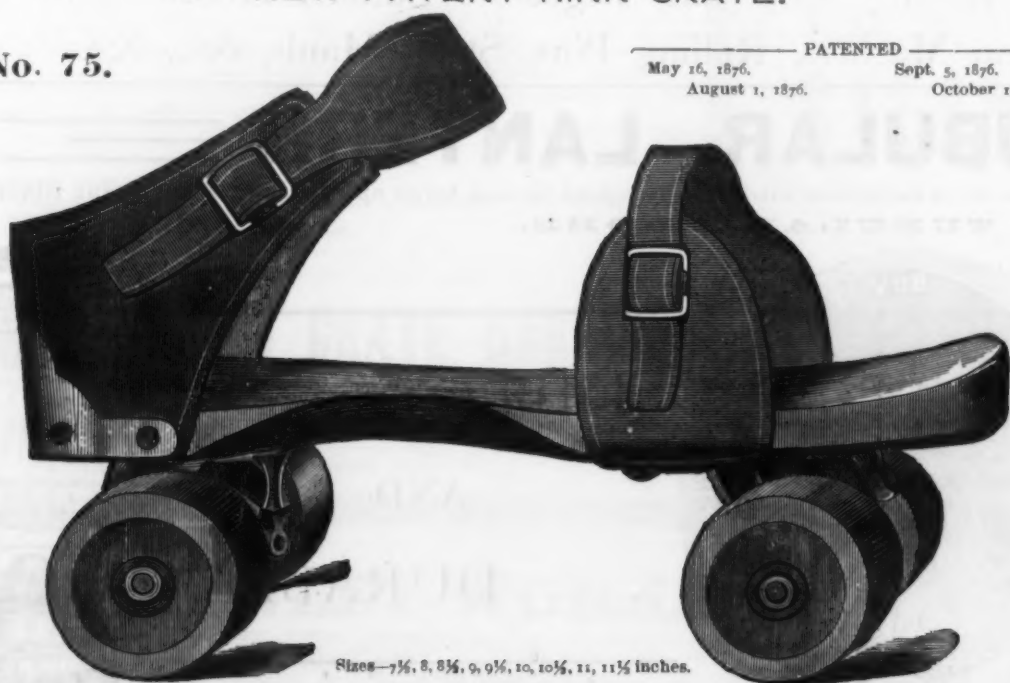
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No. 75.



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All necessary information is furnished concerning the indicator, its application and directions for its use. Additions, as developed by American practice, and an appendix of formulae and rules useful to engineers, are given in this revised edition.

Barr.—Practical Treatise on High Pressure Steam Boilers. By W. M. Barr; illustrated, 456 pages, 8vo, cloth; 1879 \$4

This book does not include marine and locomotive boilers, but is intended to meet the wants of boiler makers, steam users and engine builders in general. Considerable space is given to steel and its tests, and the chapters on the strength of iron and steel have been carefully compiled.

Bourne.—A Catechism of the Steam Engine. By John Bourne; illustrated, 419 pages, 12mo, cloth; 1857 \$1.75

A standard work on the principles, construction and management of steam engines of every class. This book commends itself to young engineers and the general reader.

Box.—A Practical Treatise on Heat as Applied to the Useful Arts. By Thomas Box; 3d edition, revised and enlarged, 296 pages, 8vo, cloth, London, \$5

Many additions have been made in this edition, especially to the subjects of evaporation, heating liquids and air, and ventilation. The chapters on combustion, steam boilers, chimneys, &c., have been corrected, and a copious index has been added, making this valuable work more reliable and useful for reference.

Burgh.—Practical Rules for the Proportions of Engines and Boilers, for Land and Marine Purposes. By N. P. Burgh; new edition, 219 pages, 12mo, cloth, London, 1878 \$1.50

This collection of rules will prove of practical value to the designer of any class of steam engines. All the details are carefully worked out and explained. The work includes the subject of toothed wheels (gearing).

Campin.—The Construction of Iron Roofs. By Francis Campin, C. E.; 8 plates and diagrams, 38 pages, small 4to, cloth; \$2

A concise account of the theory of lattice girders, trusses and arches, as applied to roof structures, with practical remarks, useful to those actually engaged in the construction of iron roofs.

Du Bois.—Elements of Graphical Statics. By Prof. A. J. Du Bois; 3d edition, 8vo, cloth, 1 vol., text, 408 pages, and an atlas of 32 plates; 1879 \$3.50

This work forms a complete treatise upon every variety of cranes, bridge, roof and suspension trusses, braced and stone arches, pivot and draw spans, continuous girders, &c. It includes graphic and algebraic methods of calculation of the strains in every structure that occurs in engineering practice. It is one of the most complete presentations of the new graphic method in English professional literature.

Hatfield.—Theory of Transverse Strains and Its Application to the Construction of Buildings. By R. G. Hatfield, Architect; 2d edition revised and enlarged, 630 pages, 8vo, illustrated with nearly 150 engravings, cloth, \$5

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Fairbairn.—Principles of Mechanism and Machinery of Transmission. By Wm. Fairbairn; 150 illustrations, 266 pages, 12mo, cloth; 1880 \$2.50

Comprises the principles of wheels and pulleys, strength and proportion of shafts, coupling of shafts, engaging and disengaging gear, and remarks on friction and lubrication.

Marks.—Relative Proportions of the Steam Engine. By Prof. Wm. D. Marks; 29 illustrations, 161 pages, 12mo, cloth; 1878 \$1.50

The engine designer will find this an instructive work, in that it will enable him to calculate with certainty not only sizes and strengths with present materials, speeds and pressures, but also to use other materials or pressures and still be able to be sure of his results. Portions of the mathematics are difficult, but aside from this fact the book contains much valuable matter, and is one of the best works on American practice that has ever been issued.

Trautwine.—Civil Engineer's Pocket Book. By John C. Trautwine, C. E.; 8th edition, revised and corrected, 690 illustrations, 693 pages, 12mo, morocco, tucks, gilt edges; \$5

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This work, which was published in parts during 1881, is the latest addition to the designs adapted for use among builders and architects, and is about the only volume which has given attention to the modern features of architecture which have appeared during the past few years. The drawings presented are from prominent architects of New York, Boston and other localities, and all the designs given are original in this work. Queen Anne, Eastlake, Elizabethan and other modernized styles are presented. A number of low-priced cottages, adapted to the requirements of the seaside and summer resorts, are included.

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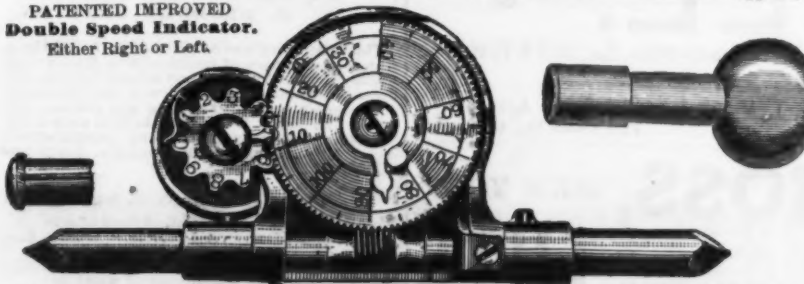
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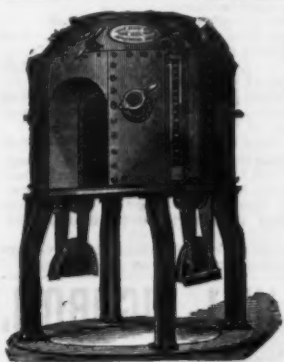
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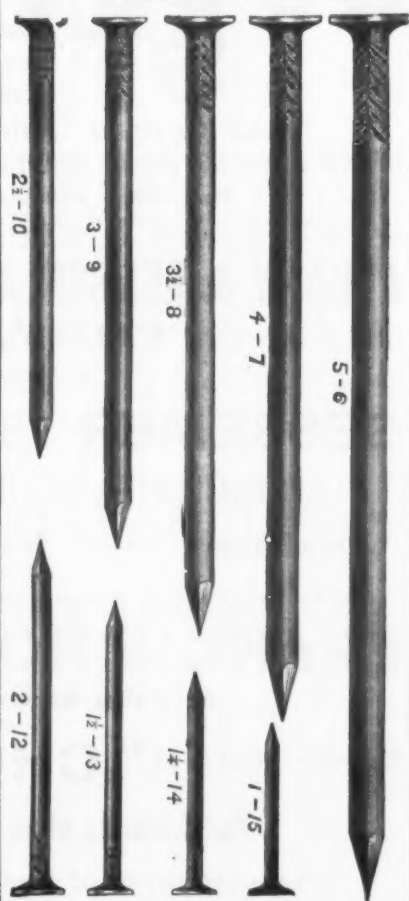
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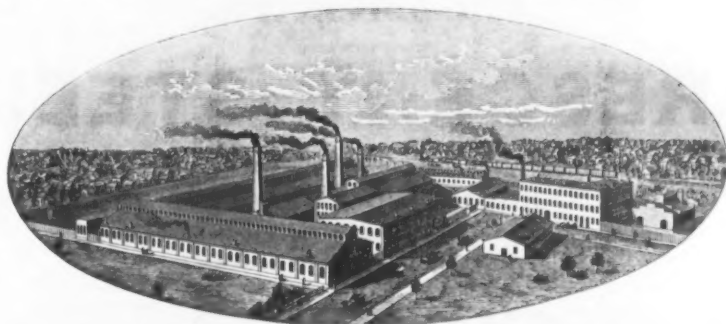
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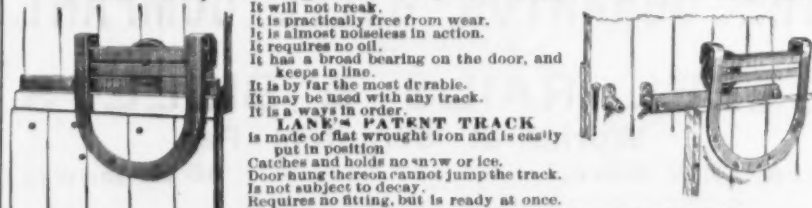
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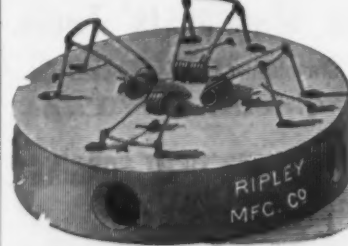
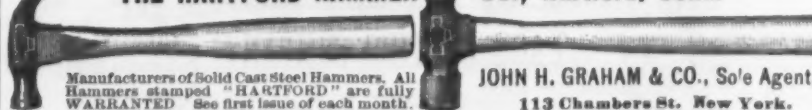
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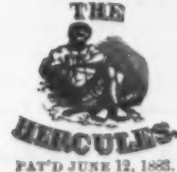
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This list excludes all ordinary trade announcements proper, and is strictly confined to trade-marks and brands, whether blocks, electros or other appliances for illustrations, with just sufficient letterpress to describe the kind of article to which the mark, &c., is applied, and the names and addresses of the owners or lawful users. For the sake of uniformity in space and charges, each mark occupies a space measuring 1 inch deep by 1½ inches wide, and the uniform charge is \$2.50 (10s.) only for each such space, payable in advance unless we have already an open advertising account with the firm giving the order.

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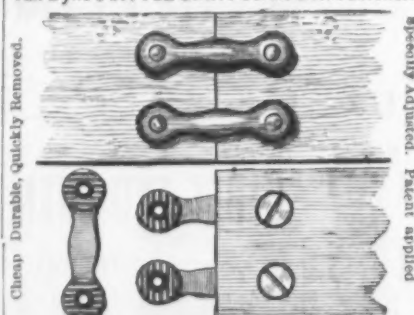
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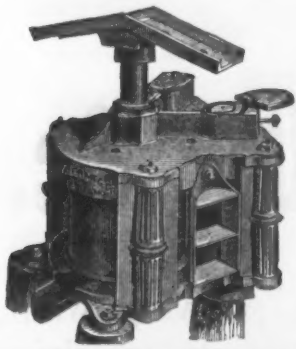
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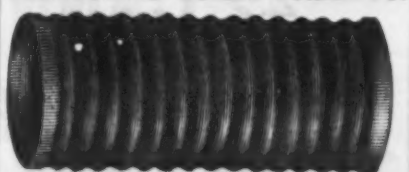
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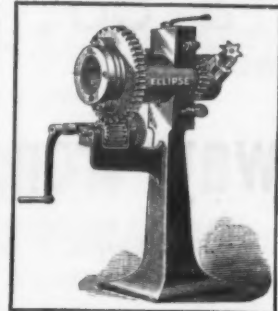
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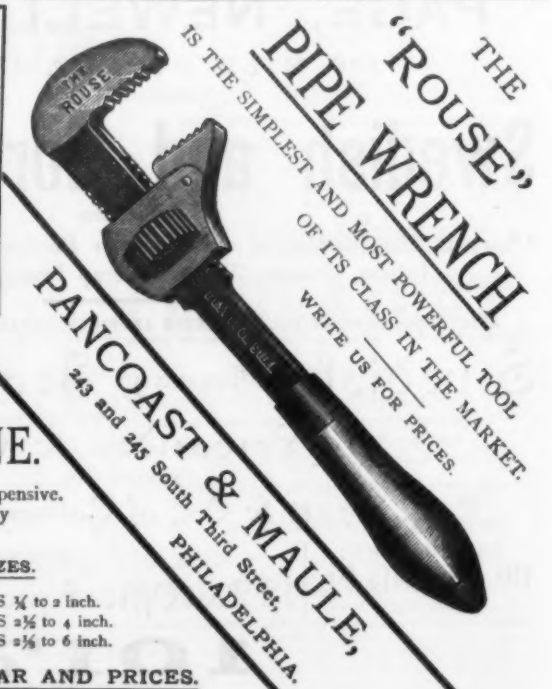
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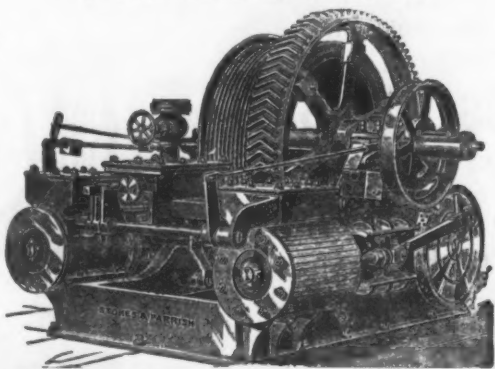
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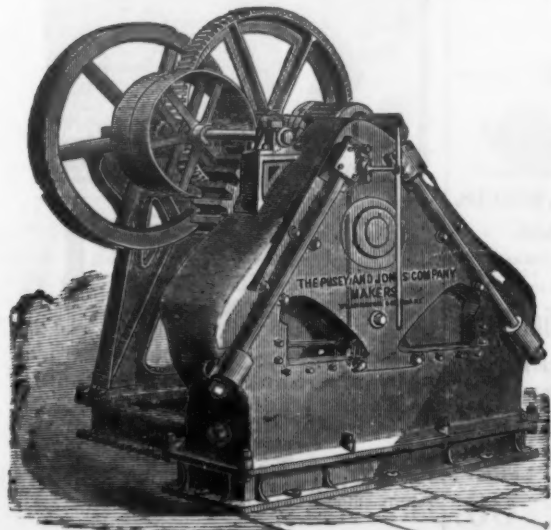
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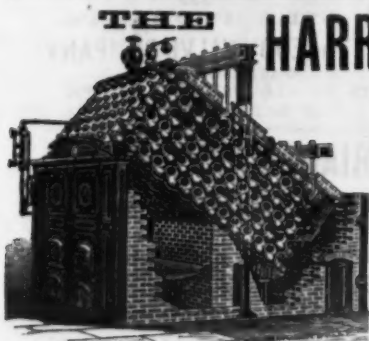
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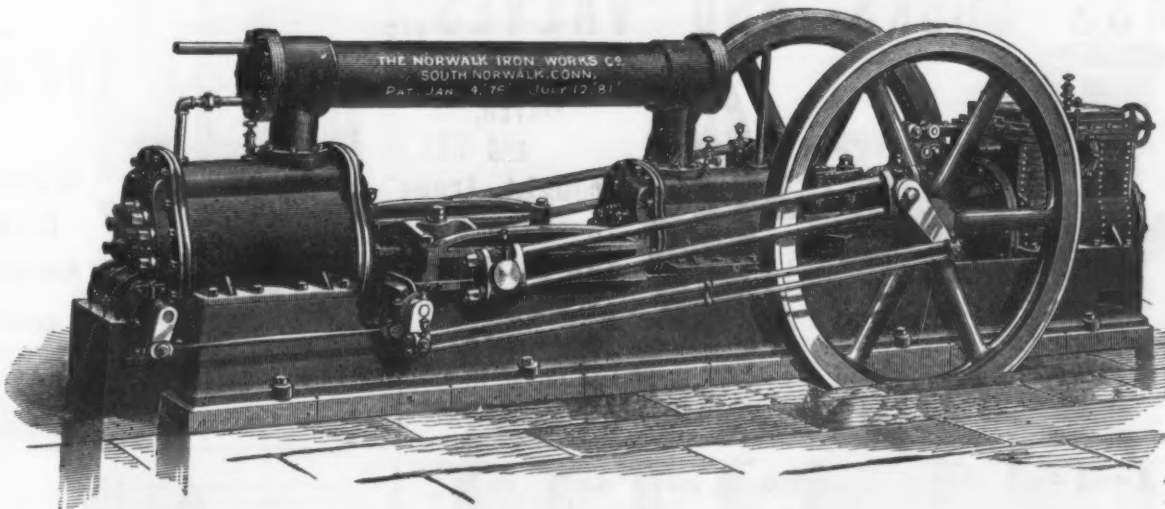
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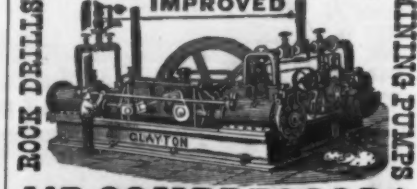
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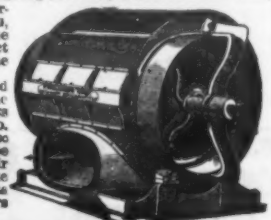


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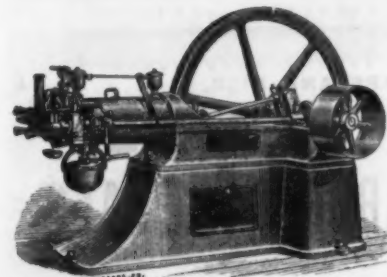
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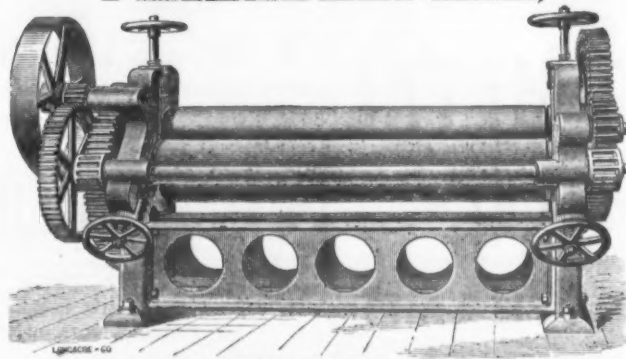
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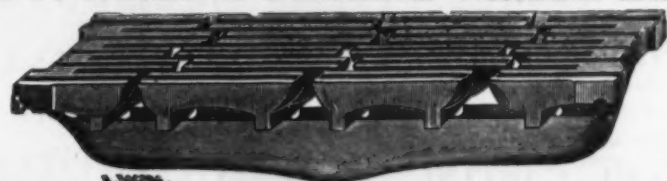
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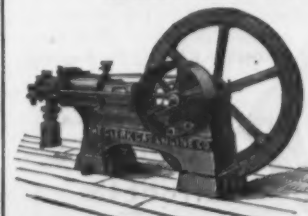
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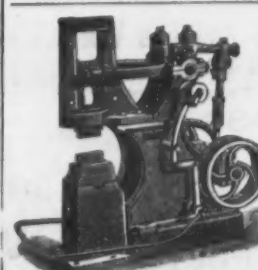
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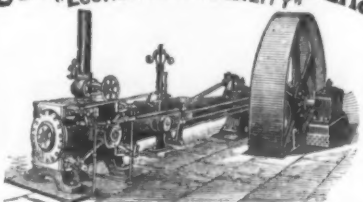
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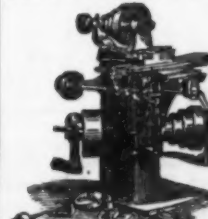
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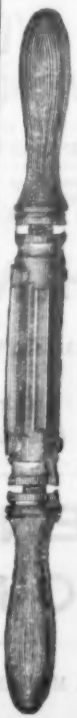
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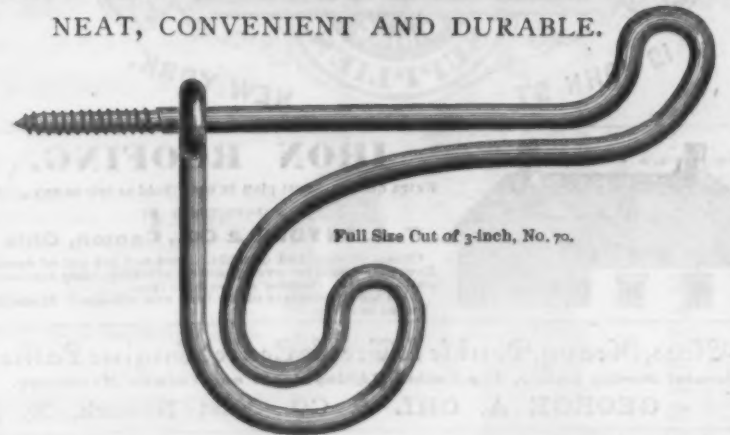
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